NOTES ON THE GENUS *CLERODENDRUM* (*VERBENACEAE*). XXIX

Harold N. Moldenke

CLERODENDRUM Burm.

Additional bibliography: Mold., Phytologia 61: 316--338. 1986; Takhtajan [transl. Crovello], Florist. Regions 67. 1986.

Additional excluded taxa: *Clerodendrum leandrii* Mold., Lloydia 13: 207--208. 1950 = *Radamaea* sp., *Scrophulariaceae*. *Clerodendrum brevicalyx* Mold. ex Holmgren & al., Ind. Vasc. Pl. Type Microf. 441 nom. nud. 1985 = ?

CLERODENDRUM KAEMPFERI (Jacq.) Sieb.

Additional synonymy: *Clerodendron coccineum* D. Dietr., Syn. Pl. 3: 616. 1843. *Volkameria coccinea* Herb. ex D. Dietr., Syn. Pl. 3: 616 in syn. 1843. *Clerodendrum kaempferi* Sieb. ex Hassk., Cat. Pl. Hort. Bogor. Cult. 136. 1844; Mold., Résumé Suppl. 15: 19 in syn. 1967; Alexander, Hong Kong Shrubs 28. 1971 [not *C. kaempferi* Fisch., 1821]. *Clerodendron dentatum* Wall. apud Voigt, Hort. Suburb. Calc. 466. 1845. *Volkameria kämpferiana* Jacq. apud Voigt, Hort. Suburb. Calc. 466. 1845. *Volkameria kämpferi* Jacq. apud Sieb. & Zucc., Abhandl. Akad. Wiss. Muench. Math.-Phys. 4 (3): 153 in syn. 1846. *Clerodendron speciosissimum* Hort. Angl. ex Schau. in A. DC., Prodr. 11: 672 in syn. 1847 [not *C. speciosissimum* Paxt., 1837, nor Van Geert, 1836]. *Clerodendron squamatum* β *indicum* Hassk., Retzia 1: 62--63. 1855. *Clerodendron squamatum* var. *indicum* Hassk., Retzia 1: 63. 1855. *Volkameria koempferi* Jacq. apud Franch. & Savat., Enum. Pl. Jap. 1: 359 in syn. 1875. *Clerodendron illustre* N. E. Br., Gard. Chron. 56 [ser. 2, 22]: 424. 1884. *Clerodendron squamatum* Wahl ex Bachman, Flora 69 [ser. 2, 44]: 414. 1886. *Clerodendron squamatum* Cham. ex Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 175. 1895. *Clerodendron coccineum* Hort. Morr. ex Voss in Vilm., Blumengärt. 1: 832 in syn. 1895. *Clerodendron speciosissimum* "Hort. ex p[arte]" ex Voss in Vilm., Blumengärt. 1: 832 in syn. 1895. *Clerodendron kaempferi* Sieb. apud Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 2: 1276. 1895 [not *C. kaempferi* Fisch. ex Morr., 1845, nor "Sieb. herb. ex Miq.", 1903, nor Steud., 1948]. *Clerodendron squammatum* Vahl apud Pynaert, Rev. Hort. Belg. 22: 284 & 287 sphalm. 1896. *Clerodendron squamutum* Vahl apud Bretschn., Hist. Europ. Bot. Discov. China 136 in syn. 1898. *Clerodendron coccineum* D. Dietz. apud H. J. Lam, Verbenac. Malay. Arch. 363 in syn. 1919. *Clerodendron squamatum* var. *typicum* H. J. Lam, Verbenac. Malay. Arch. 363. 1919. *Clerodendron dentatum* "Wall. ex Steud." apud Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 93 & 108 in syn. 1921. *Clerodendron coccineum* H. K. ex Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: viii in syn. 1921. *Clerodendron squamatum* var. *typica* Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 93. 1921. *Clerodendrum infortunatum* Lour [in part] apud E. D. Merr., Trans. Amer. Philos. Soc. 24 (2): 337 in syn. 1935 [not *C. infortunata* L., 1753, nor *C. infortunatum* Auct.,

1955, nor Blume, 1967, nor Dennst., 1959, nor Gaertn., 1965, nor Miq., 1968, nor Vent., 1821, nor Willd., 1976]. *Clerodendron infortunatum* "Lour., in part" ex Mold., Prelim. Alph. List Inv. Names 20 in syn. 1940 [not *C. infortunatum* Auct., 1963, nor Blume, 1947, nor Gaertn., 1788, nor Lam., 1947, nor Lindl., 1918, nor Schau., 1918, nor F.-Vill., 1882, nor Walp., 1843, nor Wight, 1850, nor Willd., 1976]. *Clerodendron kaempferi* (Jacq.) Sieb. ex Mold., Suppl. List Inv. Names 2 in syn. 1941. *Clerodendron* "(or *Volkameria*?) *dentate* Roxb." apud Fang, Icon. Pl. Omeiens. 1: pl. 69. 1944. *Clerodendron dentata* Roxb. ex Pételot, Pl. Méd. Camb. Laos Vietn. 2: 255 in syn. 1953. *Clerodendron kaempferi* (Jack) Sieb. ex Tingle, Check List Hong Kong Pl. 38 sphalm. 1967. *Clerodendron speciosissimum* Hort. ex Mold., Phytologia 31: 396 in syn. 1975. *Clerodendron dentatum* (Roxb.) Wall. ex Mold., Phytol. Mem. 2: 384 in syn. 1980. *Clerodendrum kaempferi* (Jack.) Sieb. ex Hu, Enum. Chin. Mat. Med. 6. 1981.

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3. 1845; Voigt, Hort. Suburb. Calcut. 466. 1845; Walp., Repert. Bot. Syst. 4: 101, 107--108, & 114. 1845; Sieb. & Zucc., Abhandl. Akad. Muench. Math.-Phys. 4 (3) [Fl. Jap. Fam. Nat. 2]: 153--154. 1846; Schau. in A. DC., Prodr. 11: 657, 669, 672, & 674. 1847; Walp., Repert. Bot. Syst. 6: 691. 1847; Hassk., Pl. Jav. Rar. 489. 1848; Hassk., Retzia 1: 61--63. 1855; Regel, Gartenfl. 5: [353] & 354/355, pl. 178. 1856; Buek, Gen. Spec. Syn. Candoll. 106, 502, & 503. 1858; Miq., Fl. Ned. Ind. 2: 878--881. 1858; C. Muell. in Walp., Ann. Bot. Syst. 5: 711--712. 1860; Dalz. & Gibs., Bomb. Fl. Suppl. 69. 1861; A. Wood, Class-book, [ed. 42], imp. 1, 539. 1861; Anon., Journ. Hort. 28 [ser. 2, 3]: 515. 1862; W. J. Hook., Curtis Bot. Mag. 88 [ser. 3, 18]: pl. 5294 in textu. 1862; Seem., Bonplandia 10: 94. 1862; Bocq., Adansonia, ser. 1 [Baill., Rec. Obs. Bot.] 3: 214 & 215. 1863; A. Wood, Class-book, [ed. 42], imp. 2, 539 (1863) and [ed. 42], imp. 3, 539. 1865; Miq., Prol. Fl. Jap. 31. 1865; Miq., Ann. Mus. Bot. Lugd.-Bat. 2: 99. 1865; A. Wood, Class-book, [ed. 42], imp. 4, 539 (1867), [ed. 42], imp. 5, 539 (1868), [ed. 42], imp. 6, 539 (1869), and [ed. 42], imp. 7, 539. 1870; Kurz, Rep. Veg. Andam. App. A: 45. 1870; A. Wood, Class-book, [ed. 42], imp. 8, 539. 1872; Carr., Rev. Hort. 46: 110--111. 1874; Firminger, Man. Gard. India, ed. 3, 529 & 609. 1874; Roxb., Fl. Indica, ed. 2, imp. 2, 478. 1874; Franch. & Savat., Enum. Pl. Jap. 1: 359. 1875; Kurz, Prelim. Rep. For. Veg. App. C: xv. 1875; A. Wood, Class-book, [ed. 42], imp. 9, 539. 1876; Baines, Garden Lond. 11: 405. 1877; Hance, Journ. Bot. Brit. 18 [ser. 2, 8]: 13. 1879; Berge, Pflanzenphysiogn. 94. 1880; Fern.-Villar & Naves in Blanco, Fl. Filip., ed. 3, 4: Nov. App. 161. 1880; Regel, Gartenfl. 29: 22--24. 1880; Baines, Garden Lond. 19: 453--454. 1881; A. Wood, Class-book, [ed. 42], imp. 10, 539. 1881; N. E. Br., Gard. Chron. 56 [ser. 2, 22]: 424. 1884; Matsum., Gakugeisirin 14: 465. 1884; Mason in E. Balf., Cyclop. India 3: 741. 1885; C. B. Clarke in Hook. f., Fl. Brit. India 4: 593--594 & 596. 1885; Bachman, Flora 69 [ser. 2, 44]: 414, pl. 9, fig. 17 & 18. 1886; Maxim., Bull. Acad. Imp. Sci. St.-Pétersb. 31: 83, 85, & 86. 1886; Maxim., Mél. Biol. 12: 520 & 521. 1886; "W. H. G.", Garden Lond. 33: 412/413. 1888; Woodrow, Gard. India, ed. 5, 419. 1889; Forbes & Hemsl., Journ. Linn. Soc. Lond. Bot. 26 [Ind. Fl. Sin. 2]: 262. 1890; Lubbock, Seedlings 2: 373. 1892; "W. W.", Garden Lond. 42: 562 & 562/563, pl. 889. 1892; Anon., Garden Lond. 43: 337. 1893; Bois, Dict. Hort. 1: 334. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 560--562. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 175. 1895; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 2: 1219 & 1276. 1895; Voss in Vilm., Blumengärt. 1: 829 & 832. 1895; Pynaert, Rev. Hort. Belg. 22: 252, 253, 284, & 287. 1896; Duss, Ann. Inst. Colon. Marseille 3: [Fl. Phanerog.] 468. 1897; Bretschneider, Hist. Europ. Bot. Discov. China 136 & 198. 1898; Matsum., Bot. Mag. Tokyo 13: 131. 1899; Solered., Syst. Anat. Dicot. 713 & 714, fig. 151 C & D. 1899; Diels, Engl. Bot. Jahrb. 29: 550. 1900; Koord. & Valet., Meded. Lands Plant. Bog. 42: [Beijdr. Boomsart. Java] 212. 1900; Kuroiwa, Bot. Mag. Tokyo 14: 126. 1900; Diels, Fl. Cent.-China 550. 1902; Gamble, Man. Indian Timb., ed. 2, imp. 1, 543. 1902; Mak., Bot. Mag. Tokyo 17: 91. 1903; T. Cooke, Fl. Presid.

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Illustrations: Jacq., Icon. Pl. Rar. 3: pl. 500 (in color). 1792; Kerner, Hort. Semperviv. pl. 112 (in color). 1803; Edwards, Bot. Reg. 8: pl. 649 (in color). 1822; Lodd., Bot. Cab. 8: pl. 796 (in color). 1823; Loisel.-Deslong. in Mordant de Launay, Herb. Amat. 8: pl. 519 (in color). 1827; Reider, Ann. Blumist. 8: pl. [6] (in color). 1832; Drapiez, Herb. Amat. Fl. 6: pl. 408 (in color). 1833; Berge, Pflanzenphysiogn. 94. 1880; Bachman, Flora 69 [ser. 2, 44]: 414, pl. 9, fig. 17 & 18. 1886; Pynaert, Rev. Hort. Belg. 22: 253 (in color). 1896; Solereder, Syst. Anat. Dicot. 713, fig. 151 C & D [anat.]. 1899; D. H. Scott in Solereder, Syst. Anat. Dicot. [transl. Boodle & Fritsch] 1: 632, fig. 151 C & D [anat.]. 1908; Neal, In Honolulu Gard. 271, fig. 59e. 1928; Fang, Icon. Pl. Omeien. 1: pl. 69. 1944; Bowden, Amer. Journ. Bot. 32: 198, fig. 202 [anat.]. 1945; Metcalfe & Chalk, Anat. Dicot. 2: [1028], fig. C & D [anat.]. 1950; Bor & Raizada, Some Beaut. Indian Climb. 148, fig. 93. 1954; Sharma & Mukhopadhyay, Journ. Genet. 58: 381, pl. 9, fig. 7 & 8 [anat.]. 1963.

A small, erect, gregarious, semi-woody or only basally woody shrub or subshrub, 0.5--3 m. tall. ramose or often single-stemmed, spreading rapidly by underground stems; branches rather stoutish, medullose or hollow, very obtusely tetragonal, often deeply sulcate between the angles in drying, minutely and obscurely strigillose-puberulent or glabrate (except for the nodes); nodes annulate with a

narrow band of long, interpetiolar, multicellular, white hairs; principal internodes 1.8--4.5 cm. long; leaves decussate-opposite, large; petioles cylindric, stout (especially at the base), 1.6--24.5 cm. long, pulverulent-puberulent, the lowest 1 cm. on the largest ones usually collapsing quickly in wilting; leaf-blades thin-membranous or chartaceous, dark- or deep-green and dull or shiny above, much paler beneath, ovate or broadly ovate to obcordate, 5.9--30 [--35] cm. (or more) in length, 5--20 [--35] (or more) sm. wide, apically abruptly acute or very shortly acuminate, marginally subentire or repand to denticulate, basally deeply cordate with the lobes often overlapping, very sparsely strigillose or glabrous above, minutely pulverulent and densely squamulose with glistening, golden, peltate scales beneath; midrib stoutish, flat or subprominulent above, prominent beneath; secondaries slender, 6--9 per side, the 2 or 4 lowermost issuing palmately from the lamina-base, the lowest with numerous conspicuous tertiaries extending into the basal lobes, flat or subprominulent above, prominulent beneath; vein and veinlet reticulation rather abundant, the larger parts somewhat conspicuous (but not prominulent) above, flat or the larger parts subprominulous beneath; inflorescence terminal or a pair of cymes also axillary in the uppermost leaf-axils, the terminal panicle large, dense, and showy, 27--34 cm. long, 15--18 cm. wide, composed of 9--14 pairs of ascending, many-flowered, spreading, rather short-stipitate cymes, with short sympodia, all parts deep bright scarlet or red; peduncles stoutish, 4.5--6 cm. long, minutely puberulent or glabrate, often deeply sulcate (along with the sympodia) in drying; pedicels slender, 5--15 mm. long, puberulent; bracts foliaceous, ovate or spatulate, long-stipitate, to 2.5 cm. long and 2 cm. wide; bractlets linear or oblong, 5--15 mm. long, to 2 mm. wide, puberulent; prophylla linear or oblong, 5--11 mm. long, puberulent; flowers fragrant, relatively small; calyx campanulate, red, 5--10 mm. long, rather widely spreading and loose, deeply 5-lobed or -parted to ½ or 2/3 its length, the tube about 2 mm. long, glandular-hairy on both surfaces, the lobes ovate or lanceolate to triangular, about 3.5 mm. long, apically acute or short-acuminate, externally puberulent; corolla hypocrateriform, red or scarlet to vermillion, to 3.8 cm. long overall, the tube very slender, 1.5--2 cm. long, about twice as long as the calyx, externally obscurely puberulent, the limb 5-lobed and about 15 mm. wide, the lobes spatulate or obovate, 3--8 mm. long, about 3 mm. wide, subequal or unequal, apically rounded, dorsally puberulent; stamens 4, inserted in the upper part of the corolla-tube, long-exserted, ascending, extending 3 cm. beyong the mouth of the corolla-tube, circinately curved in bud; filaments slender, 4--5 cm. long, slightly villous; anthers oblong, versatile, yellow; style slender, 6--8 cm. long, usually extending about 2 cm. beyond the corolla-mouth, glabrous; stigma minute, shortly bifid, the branches apically acute; ovary superior, 4-celled, externally glabrous; ovules 1 per cell, pendulous; fruiting-calyx patelliform, coriaceous, rather fleshy, greenish-white dorsally, bright-red ventrally, accrescent, glabrous, enclosing the fruit, 4 cm. in diameter, the lobes lanceolate, 10--14 mm. long, 3--5 mm. wide, strong-

ly reflexed in age; fruit drupaceous, at first green, later red, finally blue or bluish-black to black, globular, 6--13 mm. long and wide, shorter than the mature calyx, succulent, the weight of the mature infructescence often bending the branches to the ground; seeds black; chromosome number: 2n = 52, 60, or 92.

This is the type species of the Section *Squamata* Schau. in Subgenus *Euclerodendron* (Schau.) Thomas. The type of the species was collected by Jacquin in the Schönbrunn gardens in Vienna from cultivated material originally from Mauritius (according to his assertion). He named it in honor of Engelbert Kämpfer (1651--1716), a German physician and traveler, apparently in the belief that the plant represented Kämpfer's pl. 58, published by Banks in 1791, which, however, we believe represents the very closely related *C. japonicum* (Thunb.) Sweet instead.

The type of *C. squamatum* was collected by Pierre Sonnerat (1748--1814) in the East Indies, sent by him to Lamarck and forwarded by Lamarck to Vahl. The type of *C. illustre* is a plant collected in the Veitch Nurseries on September 4, 1884, and deposited in the Kew herbarium.

Clerodendrum kaempferi has been encountered by collectors in forests and bamboo jungles, in open places, in hammock clearings, and at the margins of woods, along roadsides and streamsides, in moist fields and yards, in sandy soil on dry level land, on dry gentle slopes and hillsides, in thickets and light woods, along grassy trailsides, among limestone rocks near the sea, in damp or wet places at the edges of ponds, and on village commons, at 10--2300 m. altitude, in flower from April to January, in fruit in July and September. Dee and Bunpheng report it common in open pine forests and along the edges of evergreen forests in Thailand. It is said often to be abundant in secondary vegetation and near human habitations. It has been introduced along roadsides at Antonina in Paraná, Brazil. On Hainan island Lei reports it "fairly common in sandy soil of thickets on dry level land" and as "scattered shrubs abundant on village commons". In India it is said by Sharma (1982) to flower from December to March and by both Patel (1968) and Bor & Raizada (1954) in March and April. Bojer (1837) says that in Mauritius it normally flowers in May and June.

Clerodendrum kaempferi is a very handsome species, apparently found wild from India and the Andaman Islands to southern China, Hainan, and Taiwan, southward and eastward into Malaya and Indonesia. It is widely cultivated in many tropical and subtropical countries in both hemispheres and there tends to escape and become naturalized. It is grown in greenhouses and as a specimen plant in more temperate regions.

Authors differ greatly in their opinions about the actual origin of this species. A chronologic review of its history illustrates this situation. Jacquin (1793) asserts that the type specimen came from cultivated plants in Austria which originated in Mauritius. Raeuschel (1797) asserts that what he called *C. kaempferi* is originally from India, while what he called *C. squamatum* is from the East Indies ["Ind. orient."]; Lamarck (1808) considered its native land

to be China and Japan; Bojer (1837) found it cultivated in Mauritius, but introduced there from China and Japan; Voigt (1845) found it growing in gardens near Calcutta.

Siebold & Zuccarini (1846) and Miquel (1865) assert definitely that the species was introduced into Japan from Korea. Franchet & Savatier (1875) say; "Hab[itat] in Japoniâ, e remotiore tempore introductum. Kiou-siou, circa Nangasaki e Corea allatum, teste Thunberg." Mason (1885) comments that "The Burmese gardens are ornamented with this species, which bears a large cone of superb scarlet flowers. Although said to be originally from China, it appears to be naturalized in Burma". Maximowicz (1886) gives its distribution as "China australi (Hooker et Arnott): ins. Hainan (Hancock), in boreali et in Japonia cultum. India, Mauritius. Ex Kaempfero in Japoniam intriductum ex ins. Luzon et ex Korea, inde et ab indigenis Rjuke giri et Korei giri appellatur". Diels (1902) found it at Chunking in central China; Brandis (1906) lists it from 3000 feet altitude in Sikkim, as well as from Assam, Silhet, Singapore, and China and adds "Often cultivated"; Cooke (1906) claims that it is a "native of China and Sumatra". Dunn & Tutcher (1912) found it naturalized in Hong Kong, where it flowers in May.

Hallier (1918) gives the distribution of the species, as known to him, as Japan, China, Hainan, Sikkim, East Bengal, Bhutan, Assam, Burma, the Andaman Islands, Singapore, Sumatra, Java, Celebes, and the Philippine Islands; Bakhuizen (1921) lists it from Japan, China, India, the Philippines, and the Malay Archipelago; Neal (1928) describes it sa cultivated in Hawaii, with its native home given as "India and China". Grey & Hubbard (1933) found it cultivated in Cuba, where it was collected by Atkins in 1906. Hu (1938) lists the species from Fukien, Kwangsi, Kwangtung, Szechuan, and Yünnan provinces, China. Kanjilal and his associates (1939) found it in Assam, wild and "also widely cultivated in the gardens", flowering there in the "cold season". Lam & Meeuse (1942) give its natural distribution as "India and China to Japan, Philippines, and Moluccas".

Fang (1944) tells us that "This plant has been cultivated commonly in various gardens in western Szechuan. It is highly appreciated for its beautiful scarlet flowers and ample inflorescences as well as for its long flower-season from May to July". Pételot (1953) claims that it occurs throughout Indochina, as well as in "trop[ical] Asia and China". Bor & Raizada (1954) claim it to be a "Native of China, extending to the Himalayas, Japan and Sumatra, cultivated throughout the tropical and subtropical parts of the globe".

Masamune (1955) reports the species "introduced (?)" in Okinawa; Nath (1960) reports it from the Southern Shan States of Burma; Deb (1961) found it "generally under cultivation in homestead compounds" in Manipur. Hundley & Ko (1961) assert that it is a "Native of India and China. Naturalized in Ceylon", listing it also from Burma; Rolla (1963) claims that it is "common" in Sikkim, while Banerji (1965) reports it only "occasional" in Nepal. Burkill (1965) informs us that it is "found from the Himalayas and Japan to Sumatra and Celebes; in the [Malay] Peninsula it occurs about Singapore and Malacca. Since 1790 it has been in cultivation in European gardens, and probably came into the Peninsula through this". Ohwi (1965) re-

fers to it, on the other hand, as a "Malayan shrub often cultivated in the warmer parts of our area [Japan] as an ornamental". Sen & Naskar (1965), as well as Maheshwari & Singh (1965), report it cultivated in India; Matthew (1966) lists it from West Bengal. Yamazaki (1966) asserts that it is a "Native of tropical Asia"; Rose (1968) found it cultivated in France; the Baileys (1976) list it as cultivated in the United States, but native to "China & India"; Sharma (1982) lists it from East Punjab. My wife and I observed it in outdoor cultivation at 7000 feet altitude in Sri Lanka. According to Synge (1956) and Bor & Raizada (1954) it has been in cultivation in England since 1790. It is probable that the "*C. japonicum*" recorded from Karakelong, in the Talaud Islands, is really *C. kaempferi*. The *Herb. Hort. Bot. Bogor. XV.J.A.XXXII.8a*, cited below, cultivated in Java, is said to have come originally from Borneo.

The color of the corollas of *C. kaempferi* has been described as "scarlet" by Roxburgh (1832), Mason (1885), Cooke (1906), Dunn & Tutcher (1912), Neal (1928), Fang (1944), Bor & Raizada (1954), Deb (1961), Banerji (1965), and Patel (1968), as well as on *How 70751* and *Moldenke & al. 28161*, as "brilliant scarlet" by Woodrow (1884), "deep-scarlet" by Pal & Krishnamurthi (1967), "bright-scarlet" by the Baileys (1976), "scarlet-red" on *Liang 61985*, "crimson" by Burkill (1965), "coral-crimson" by Firminger (1918), "vermillion" on *Araujo & Angeli 1328*, *Hatschbach 34848*, *Mello Barreto 4386*, and *Reitz 6874*, "red" on *Bunpheng 857*, *Dee 578*, *Eberhardt 4911*, *Gressitt 45 & 826*, *Larsen & Larsen 34222*, *Lei 196*, *Pickles 2952*, *Tak 98*, *Tsiang 2123*, *Tsui 306*, and *Yates 2525*, "bright-red" on *Chun & Tso 43442*, *Liang 61548*, and *Sumithraarachchi & al. DBS.509*, "orange-red" on *Lam 2775*, "orange" on *Congdon 734*, "strong reddish-orange" on *Avery 1289*, and "red or orange" by Pételot (1953).

Common and vernacular names recorded for the species include "ba-lantana", "ban dó", "bantaná", "ban trăng", "bhandariphul", "bugyini". "bugy-ni", "bu-gynee-nee", "bu jī nee", "ch'au shi mut li", "ch'êng-t'ung", "ch'êng-t'ung-hua", "clerodendre ecailleux", "dhopat-tita", "dok pung ping dong", "fi giri", "flor de păríđá", "fung mi chu", "fung mī chū", "fun nam", "giri", "higiri", "hi guiri", "hpetnan", "Kämpfers Losbaum", "kaukgyi-pan", "kom ping", "korei giri", "lapung ping", "leo dó", "orokdang", "pagoda flower", "pak yat hung", "pangil pangil", "patrang", "peragu écailleux", "petka", "pet pint", "phingphee daeng", "phumphi daeng", "scaled clerodendrum", "scarlet clerodendron", "scarlet clerodendrum", "sepanggil hutan" [=forest summoner of spirits], "sorot qeni", "taú giri", "tau-gisi", "tei too", "tigiri", "to kiri", tookiri", "tooth-leaved clerodendrum", "too guiri", "tou giri", "toû-giri", "volkamier de Koempfer"; and "volkamier écarlate". Tingle (1967) provides additional names in Chinese characters and Kurz (1875) provides one in Burmese characters. Miquel (1865) points out that the Japanese vernacular name, "tigiri", with its various orthographic variants, signifies "the Chinese giri".

Harler (1962) reports that the inflorescences of *Clerodendrum kaempferi* are used as cut flowers in India. Hu (1938, 1981) reports that the species is a "medicinal plant for the native T'ai people in Yünnan" and that the roots and leaves are offered in Chinese materia

medica as "Radix et folium clerodendri kaempferi". In Vietnam an infusion is drunk as a tea in the treatment of consumption -- Pételot (1953) says "Dans la province de Quảng-Tri au Centre-Vietnam, les racines bouillies donnent une tisane contra les maladies de poitrine". In Indonesia an infusion in vinegar is used to treat gonorrhea. Bor & Raizada (1954) report that the foliage is chewed to treat passing of blood in the stool and the juice of the leaves is used as a lotion in India. In Malaya the plant is used in native magic for "summoning the forest spirits". Briquet (1895), remarkably, under the name "C. *infortunatum* Lindl.", asserts that the plant "ist angeblich giftig".

The pollen is described by Serbanescu-Jitariu & Mitroiu (1973) on the basis of a Herb. Lugd.-Batav. specimen in the herbarium of the University of Cluj (as no. 89965), as: "prolat; 3-colporat, mai rar 4-colporat; văzut apical 39--72,8 mu in diam., din profil înalt 46,8--72,8 mu, lat 36,4--52 mu. Polenul scuturat din antere si văzut cu ochiul liber este galben-portocaliu, în apă la microscop portocaliu-brun, în chloralhidrat galben-pal. În genèral sporoderma prezintă aceleasi caracteristici că la polenul de *Cl. infortunatum*, cu deosebirea ca spinulii de pe suprafata acesteia sînt relativ mai mari."

Bowden (1945) and Darlington & Wylie (1956, 1961) give the chromosome count for this species as 2n = 60, based on a specimen *no. 2830-39* from the Royal Palm Nursery at Oneco, Florida. Sharma & Mukhopadhyay (1963), however, as well as Cave (1964) and Bolkhovekikh and his associates (1969) give it as 2n = 52.

The Baileys (1935) list only the Royal Palm Nursery, mentioned above, as a commercial source of seeds or plants of this species for the American horticultural trade; Mattoon (1958) lists two sources.

Sweet (1827) informs us that, as "C. *squamatum*", it was introduced [by Sir Joseph Banks] to English gardens in 1790 from China, but as "C. *dentatum*" in 1826 from the East Indies.

As to methods of cultivation, Baines (1877) states that this plant can "be raised from seeds sown as soon as ripe in autumn, but in order to obtain them the first flower-stems must not be removed, but allowed to remain on the plant until the seed is matured. Sow the seeds singly in small pots, covering them with ¼ in. of soil, they will soon vegetate and will require treating in every way similar to young plants raised from cuttings."

An anonymous "Grower" in The Garden [London] (1893) gives very elaborate and detailed instructions about the cultivation of this and related species in England. He notes that "There must be a reason for the absence of these fine flowering subjects from our collections of stove plants now-a-days. I think this is largely to be attributed to their susceptibility to the attacks of the mealy bug. If this be so, more is the pity, for they are truly grand plants when well grown, taking up a little more room than the average run of plants when cultivated as specimens, but not so when confined to small pots. Within the fog radius there is always the risk of injury after about the middle of September, but not so in the country, where I have had them good to the end of October. The fogs

cause the flowers and the buds, too, to drop in large numbers, so much so as to spoil the look of the panicles. During the summer months I have grown them most successfully for conservatory decoration. From the time of the plants opening their first flowers onwards to the end of August (and even into September in the country) I have found them to stand well, making a splendid as well as a continuous display."

Pynaert (1896) says: "Le *Clerodendron squamatum* est un des plus jolis arbustes florifières de serre chaude tempérés. Il est connu depuis longtemps dans les cultures, mais beaucoup de jardiniers ne s'en souviendront guère, car malgré ses rares merites, il a disparu de la plupart des collections. Sa culture est pourtant des plus faciles: un rempotement annuel suffit à la plante. En lui donnant un compost fertile, les panicules floraux offriront les plus vifs coloris. La floraison a lieu en juillet-août. Les arbustes sont taillés après la floraison. On provoque leur entrée dans le stade de repos en les plaçant dans un endroit un peu moins chaud de la serre.....Le *Clerodendron squamatum* est originaire de China; il peut acquerir 3 metres de hauteur. C'est une des espèces les plus brillantes par le floraison de grands panicules du plus beau rouge écarlate."

Firminger (1918) says that "The stems of this shrub rise naked from the ground about three feet, and then bear a parasol-like expansion of handsome, rich green, heart-shaped leaves, in a very stately way....When in full flower, in April and May, no plant can surpass this in beauty."

Bor & Raizada (1954) aver that "This is one of the most showy of shrubs, having great clusters of scarlet flowers which appear during March-April. It should be cut back after flowering, otherwise it becomes bare and scraggy. The plant prefers partial shade and is often attacked by insects, especially mealy bugs and scales."

Alexander (1971) comments that "The plants thrive in semi-shade, but become straggly with age and should be cut nearly to the ground after the fruits mature. Once established, it spreads by root, travelling horizontally underground for yards, with fresh stems popping up all over the place: for this reason, it is best not planted in a formal bed but rather in a border where the soil is not likely to be regularly dug up. Propagated by seeds or cuttings."

The nomenclatural and taxonomic history of *Clerodendrum kaempferi* is quite involved and there are many differences of opinion among botanical and horticultural writers about it. Some of the more important and relevant discussions are quoted, in part, hereinafter:

Loureiro (1790) describes his controversial *C. infortunatum* thus: "Sp. 1. *Clerodendrum infortunatum*. ℘ Fung mi chu. Differ. spec. *Cler.* foliis cordatis tomentosis. Lin. sp. 1. Hab., & notae. Caulis fruticosus, erectus. 7-pedalis: ramis 4-gonis, 4-sulcatis. Folia magna, cordata, lato-ovata, acuminata, sub-crenata, pilosa, rugosa, opposita, petiolis longis. Flos terminalis Corymbo racemoso, vasto. Calyx, corolla, stamina, stylus, pedunculi omnia coloris coccinei rutili. Calyx 5-fidus, campanulatus. Corolla tubo longo, tenui: limbo 5-fido, subaequali, rotundato: stamina longissima, per fissuram supremum Corollae ascendentia: antheris nutantibus, basi

emarginatis. Stylus longus: stigmate acuto, bifido. Bacca 1-sperma. Habitat Cantone. Sinarum." This appears to describe mostly C. *kaempferi* and partly C. *viscosum* Vent. according to Merrill (1935).

Poiret (1808) provides a lengthy description of his interpretation of C. *squamatum*: "Cette plante, assez semblable par son port au *Clerodendrum infortunatum*, en differe en ce que ses feuilles sont glabres, plus profondément échancrées à leur base, & que les panicules, les calices & les corolles sont également glabres: elle est d'ailleurs remarquable par la beauté de son port & ses belles panicules de fleurs.

"Ses tiges sont droites, frutescentes; elles se divisent en rameaux glabres, tétragones, marqués à chaque fâce d'un fillon assez profond. Les feuilles sont opposées, petiolées, très-grandes, ovales, longues de trois à cinq pouces, larges de deux à quatre, en coeur, & profondément échancrées à leur base, aiguës à leur sommet, entières à leur bords ou quelquefois obscurément denticulées; marquées de nervures, dont la principale est divisée en d'autres, simples pour la plupart, si l'on en excepte celles qui occupent la base de la feuille: elles se terminent à une ou deux lignes avant le bord des feuilles. La fâce inférieure de ces feuilles est glabre, d'un vert pâle, couverte d'un assez grand nombre de petits corps écailleux, arrondis ou oblongs, ombiliqués dans leur milieu, que je soupçonne être, ou quelque kermès, ou quelques plantes cryptogames parasites, voisines des ecidium. La fâce supérieure est d'un vert plus foncé, chargée de très-petits poils fort courts, rares, à peine sensibles. Les pétioles sont glabres, striés, au moins aussi longs, & même plus longs que les feuilles. Dans les dernières & jeunes feuilles ils sont pubescens, même velus à leur base, & les feuilles ciliées à leurs bords.

"Les fleurs forment une très-belle & grande panicule terminale, étalée, glabre, & dont les pédoncules communs sont profondément fillonnés, d'abord dichotomes, puis souvent trichotomes à leur seconde division; munis, à chacune de leur bifurcation, de deux folioles opposées, pétiolées, ovales, aiguës, un peu velues en dessous. Celles des ramifications supérieures se rétrécissent insensiblement, & enfin les dernières sont sessiles, étroites & subulées: chaque fleur est supportée par un pédicule filiforme, assez long. Le calice est profondément divisé en cinq découpures très-glabres, un peu colorées, ovales, aiguës, persistentes. La corolle a un tube grêle, trois fois plus long que le calice, qui se partage à son orifice en cinq divisions lanceolées, aiguës. Les étamines sont remarquables par leurs filamens, qui me paroissent de couleur purpurine, & d'une longueur bien plus considerable que dans les autres espèces: ils saillent d'environ deux pouces hors de la corolle. Les pistils sont de la même longueur.

"Cette belle espèce a été rapportée par Sonnerat des Indes orientales, qui en a communiqué des exemplaires au citoyen Lamarck. C'est d'après un de ces exemplaires que M. Vahl a établi cette espèce." Note the idea that on first glance the scales on the lower leafblade-surface might be parasitic fungi; also that the corolla-tube is described as three (not two) times as long as the

calyx.

Thunberg (1830), in transferring *Volkameria kaempferi* Jacq. to *Clerodendron*, describes the plant as an "Arbor formosissima ad ambulacra culta", but this description applies to *Sterculia platanifolia* L. f., not to our plant!

Roxburgh (1832, 1874) separates his *Volkameria dentata* by its leaf-blades being marginally acutely dentate, with the two basal lobes so large that they overlap each other, whereas in what he regards as *V. kaempferi* the leaf-blades are marginally entire and the basal lobes are smaller and not overlapping. He asserts that *V. kaempferi* is "A large, ramous, erect, shrub, now common in gardens about Calcutta; it was originally introduced from China. Is in flower during the hot and rainy season." Of *V. dentata* he says: "An erect, very elegant shrub, of three or four feet in height, a native of the Silhet district; flowering time the hot and rainy season; it has not yet ripened seed in the Botanic garden, where it grows luxuriantly, and is very ornamental when in flower. It differs from *V. Kaempferi* and *Buchanani* in the leaves being dentate, and from *urticifolia* in being a permanent shrub; besides in that species the leaves are much deeper cut around the margin, and the lobes never so large as even to meet. In all the four, the flowers are nearly alike in size, structure and colour, viz. a very bright deep scarlet."

Morren (1845) gives a detailed history of the species as interpreted by him: "Cette belle plante de serre-chaude, s'élevant en arbre branchu et richement florifière, a été introduit par la société hollandaise qui exploite en ce moment les richesses horticulturales du Japon; c'est en 1843 qu'elle a passé de Hollande en Belgique où les horticulteurs la connaissent sous le nom de *Clerodendron Kaempferi*. En Angleterre où elle est à peine introduit et où elle n'existe que dans les collections les plus riches, comme celle de duc de Northumberland, elle est connue sous le nom de *Clerodendron coccineum*. M. Lindley qui dans le Botanical register de 1844, a revu les différentes espèces du genre *Clerodendron*, l'a classée sous le véritable nom que Martin Vahl, professeur de Copenhagen, lui a donné dans le deuxième volume.....de ses Symbolae botanicae, publié en 1791. M. Lindley a démontré également que cette plante est le *Volkameria Kaempferiana* de Jacquin, dénomination fausse pour le genre, mais d'où est venue l'appellation sous laquelle les horticulteurs hollandais ont envoyé cette espece en Belgique.

"C'est encore cette même espèce que M. Paxton a donnée dans son Magazine of Botany.....pour le *Clerodendron speciosissimum*. Au reste, ce végétal avait déjà paru en Europe dès 1790, mais il y a été perdu depuis, et c'est grâce aux travaux de la compagnie hollandaise de l'exploration du Japon, que cette réintroduction a eu lieu. Le *Clerodendron squamatum* est originaire de la Chine, et si son nom générique, *Clerodendron*, rappelle son étymologie, κληρος, fortune, et δενδρον, arbre, arbre de fortune, c'est, en effet, pour nos serres une bonne fortune que son acquisition.

"Les clerodendron intitulés *Clerodendron squamatum* et *Clerodendrom squamatum verum* dans les catalogues des horticulteurs de Bel-

gique, ne sont pas des *Clerodendron* de ce nom. Nous les avons examinés et sur aucune de ces deux espèces, l'une bien différent de l'autre, n'existe le caractère spécifique du *squamatum*, à savoir les lépides écailleuses du dessous de la feuille. Sur le *Clerodendron squamatum verum*, nous avons trouvé des poils forts et gros; sur le *Clerodendron squamatum* reputé la vieille plante, les poils sont plus petits, maigres et épars.

"Il suit de là des rectifications importantes à faire. Les *Clerodendron* vendus et à ventre en Belgique, sous le nom de *squamatum* et de *squamatum verum* ne sont pas des *Clerodendron squamatum*. Seulement, le *Clerodendron Kaempferi* des horticulteurs belges et hollandais est le vrai *Clerodendron squamatum* des auteurs. Troisiemement, les *Clerodendron speciosissimum* et *coccineum* ne sont autres choses que le *Clerodendron squamatum*. Voilà ce qui reste de clair et de positif su milieu de cette tour de Babel, où avec la confusion des langues, l'horticulture des catalogues entraine encore la confusion de l'esprit. Notre premier devoir est de ramener par tous nos moyens les intelligences à ce qui est juste et honnête; et si nous blessons ici quelques intérêts, notre droit est dans la raison, la science et la vérité." It would appear that the C. *squamatum* and C. *squamatum verum* to which he refers, being without scales on the leafblades, but being, instead, pubescent there, probably are forms of C. *speciosissimum* Van Geert, or the less hairy one perhaps C. *buchanani* (Roxb.) Walp.

Siebold & Zuccarini (1846) note that "Schon Willdenow bemerkt.... mit Recht, dass die Thunbergsche *Volk. japonica* nicht mit der in Gärten unter diesem Namen kultivierten Pflanzen zusammengezogen derden könne, und nennt in der Enumeratio.....letztere *Cler. fragrans*. Persoon führt ebenfalls *V. japonica* und *fragrans* gesondert auf. Erst die neueren Schriftsteller ziehen beide wieder zusammen, lassen dagegen aber *Cl. squamatum* oder *Kämpferi* als eigne Art bestehen. Allerdings scheinen zwar zwischen dieser und *Volk. japonica* Thunb. nach des Letzteren Beschreibung seiner Pflanze einige Verschiedenheiten obzuwalten, aber da Thunberg, Kämpfer a. a. O. zu seiner Pflanze citirt, dessen Beschreibung offenbar auf *Volk. Kämpferi* hinweist (Fi kiri, i.e. ignea kiri. a colore igneo stylos floridos, perianthia ac flosculos tingente), so dürfte dieses die Abweichungen in der Beschreibung ausgleichen und demnach *Cl. squamatum* Vahl als identisch mit *Volk. japonica* Thunb. zu betrachten seyn, *Cler. fragrans* dagegen als eigne Art bestehen, deren Stammform mit einfachen Blüthen jetzt auch schon in Gärten vorkommt. C. *squamatum* ist nach Thunberg aus Korea nach Japan verpflanzt, ob C. *fragrans* auch in Japan sich finde, scheint noch zweifelhaft. Im Sieboldtschen Herbarium wenigstens fehlt sie."

Hasskarl (1855) divides C. *squamatum* Vahl into two Greek-letter varieties: alpha *japonicum* -- with the "tubo corollae calycis duplam longitud. vix aequante" and beta *indicum* -- with the "tubo corollae calyce plus duplo longiore". It seems to me than the former applies to C. *japonicum* (Thunb.) Sweet and the latter to C. *koempferi* (Jacq.) Sieb., although he seems to have regarded his *japonicum* as representing the typical "C. *squamatum* Vahl". He further observes

that his *indicum* "differunt: C. *intermedium* Cham....foliis acuminatis opacis calyce patulo semi-5-fido, laciniis oblongis acutis, corollae tubo calyce sub-4-plo longiore; -- C. *urticifolium* Wll..... pube ramorum et nervorum foliorum, foliis grosse dentatis, panicula amplissima subnuda, calyce semi-5-fido campanulato patente, corollae tubo calyce subtrilobo longiore; -- C. *Blumeanum* Schauer.....foliis cordato-ovatis, opacis, acute dentatis, glandulis raris conspersis, panicula subnuda, calyce campanulato 5-dentato, dentibus recurvis, corollae tubo calycem 6-duplo excedente.....De varieteit *indicum*, is van Singapoer verkregen en in habitus zeer gelijkvormig, doch in alles, van kleinere dimensiën, dan de var. *japonicum*."

According to Makino (1903) the "*Clerodendron Kaempferi* Sieb. Syn. Pl. Oecon. Jap. in Vern. Batav. Gen. XII (1830) p. 41, is *Sterculia platanifolia* Linn. fil. (Jap. Ao-giri)." Even if this is so as to the plant described, his transfer of Jacquin's binomial from *Volkameria* to *Clerodendron* is not invalidated by any misidentification of the plant involved.

Backer (1916), in his description of C. *squamatum* Vahl, says: "Veranderlijk wat betreft de lengte van kelk en kroonbuis. De javaansche exemplaren behooren alle tot de varieteit *japónicum* Hasskarl, waarbij de kelk 10--17 mM hoog is en de kroonbuis 15--20 mM lang. Op Sumatra en ook elders vindt men den typischen vorm, waarbij de kelk 8--10 mM, de kroonbuis 18--25 mM lang is. Op de Philippijnen treft men, behalve deze beide vormen, nog een tusschenvorm aan." The var. *japonicum* he refers to is C. *japonicum* (Thunb.) Sweet and the third Philippine form is C. *bethunianum* Low.

Merrill (1935) has investigated Loureiro's C. *infortunatum* and comments that "Loureiro's description applies unmistakably to the widely distributed species currently known as *Clerodendrum squamatum* Vahl, for which H. Lam cites about twenty synonyms. *Clerodendrum japonicum* (Thunb.) Sweet.....is the oldest binomial, if Doctor Lam be followed in treating this as a collective species, as it was based on *Volkameria japonica* Thunb. which dates from 1784. Doctor Carl G. Alm kindly supplied me with excellent photographs of Thunberg's type with critical notes. Thunberg's statement: 'Arbor vasta, excelsa' is an error; the species is a small shrub. The plant is not 'tota glabra', the branches of the inflorescence being densely hairy and with numerous intermixed glandular hairs but the pilosity is not visible to the naked eye. The leaves are glabrous. This form differs from C. *squamatum* Vahl, among other characters, by its much larger calyces. The form with smaller calyces, which is not uncommon near Canton, is C. *kaempferi* (Jacq.) Sieb. (C. *squamatum* Vahl), and this I believe to be specifically distinct from C. *japonicum* (Thunb.) Sweet."

The Baileys (1976) correctly separated C. *kaempferi* (with C. *squamatum* as a synonym) from C. *japonicum* (Thunb.) Sweet.

In summary, it may be pointed out that C. *squamatum* Vahl is regarded as the correct appellation for the species here under discussion by Bojer (1837), Siebold & Zuccarini (1846), Hasskarl (1855), Mueller (1860), Seemann (1862), Miquel (1865), Kurz (1870, 1875), Franchet & Savatier (1875), Fernandez-Villar (1880), Clarke (1885),

Mason (1885), Maximowicz (1886), Woodrow (1889), Dietrich (1842), Morren (1845), Voigt (1845), Jackson (1895), Pynaert (1896), Diels (1900, 1902), Dunn & Tutcher (1912), Backer (1916), Rodger (1922), Neal (1928), Kanjilal & al. (1939), Biswas (1941), Pételot (1953), Bor & Raizada (1954), Hundley & Ko (1961), Burkill (1965), Corner & Watanabe (1969), Rao & Verma (1969), Serbanesco-Jitariu & Mitroiu (1973), and Sharma (1982).

On the other hand, C. *kaempferi* and/or C. *squamatum* is regarded as a synonym of C. *japonicum* by Makino (1903), the Baileys (1941, 1974), Lam & Meeuse (1942), Fang (1944), Hara (1948, 1972), Masamune (1955), Mattoon (1958), Backer & Bakhuizen (1965), Banerji (1965), Ohwi (1965), Yamazaki (1966), and Pande (1967). It is regarded as a synonym of C. *speciosissimum* Van Geert by Morton (1974).

Other binomials sometimes included in the synonymy of C. *kaempferi* are: *Clerodendron* (or *Clerodendrum*) *darranii* Lévl. [by Pételot, 1953, actually a synonym of C. *japonicum* (Thunb.) Sweet], C. *fulgens* Firminger [a name that probably belongs in the synonymy of C. *speciosissimum* Van Geert], C. *japonicum* Sweet [by Alexander, 1971], C. *kaempferi* Fisch. [apparently really a synonym of C. *japonicum*], C. *leveillei* Fedde [by Pételot, 1953, a distinct species, which see], C. *scopiferum* Miq. [a distinct species, which see], C. *speciosissimum* Hort. Angl. [a synonym of C. *glandulosum* Lindl.], C. *speciosissimum* Paxt. [a synonym of C. *speciosissimum* Van Geert], and *Volkameria japonica* Thunb. [by Maximowicz, 1886, and Pételot, 1953, a synonym of C. *japonicum* (Thunb.) Sweet].

In the synonymy of *Clerodendrum kaempferi* given by me on previous pages of the present series of notes there are numerous homonyms to which reference is made. These, and how they are disposed of by me in the present series of notes, are as follows:

Clerodendron infortunatum Auct., 1963, C. *infortunatum* Schau., 1918, and C. *infortunatum* Willd., 1976, are synonyms of *Clerodendrum viscosum* Vent.; *Clerodendron infortunatum* Blume, 1947, is *Clerodendrum buchanani* (Roxb.) Walp.; *Clerodendron infortunatum* Bot. Reg. is *Clerodendrum speciosissimum* Van Geert; *Clerodendron infortunatum* Dennst.,C. *infortunatum* Lam., 1947, C. *infortunatum* Walp., 1843, and C. *infortunatum* Wight, 1850, are synonyms of *Clerodendrum villosum* Blume; *Clerodendron infortunatum* Gaertn., 1885, is *Clerodendrum infortunatum* L.; and *Clerodendron infortunatum* F.-Vill., 1882,is *Clerodendrum minahassae* Teijsm. & Binn.

Clerodendrum infortunata L., 1753, C. *infortunatum* Gaertn., 1788, C. *infortunatum* P.S., and C. *infortunatum* Vent., 1821, are all C. *infortunatum* L.; *Clerodendrum infortunatum* Auct., 1955, C. *infortunatum* Blume, 1967, C. *infortunatum* Lour. (in part), and C. *infortunatum* Willd., 1976, are all synonyms of C. *viscosum* Vent.; C. *infortunatum* Dennst., 1959, C. *infortunatum* Hassk., and C. *infortunatum* Wight are synonyms of C. *villosum* Blume; C. *infortunatum* Lindl. is C. *speciosissimum* Van Geert, and C. *infortunatum* Miq., 1968, is C. *confusum* H. Hallier.

Clerodendrum kaempferi Fisch., 1821, *Clerodendron kaempferi* Fisch. ex Morr., 1845, C. *kaempferi* Steud., 1948, and C. *kaempferi* "Sieb. herb. ex Miq.", 1903, are all synonyms of *Clerodendrum japon-*

icum (Thunb.) Sweet.

Clerodendron speciosissimum Paxt., 1837, and *C. speciosissimum* Van Geert, 1836, are in the synonymy of *Clerodendrum speciosissimum* Van Geert.

Clerodendron squamatum Hallier f. is a synonym of *C. bethunianum* Low; *C. squamatum* Hort. ex Morr., *C. squamatum* Neal & Metzger, 1934, and *C. squamatum* Rock, 1934, are *Clerodendrum speciosissimum* Van Geert; and *C. squamatum* H. J. Lam, 1923, is *Clerodendrum intermedium* Cham.

Numerous infraspecific taxa have been proposed. My disposal of these is as follows: *Clerodendron squamatum* var. *bethuniana* (Lowe) Bakh. is *Clerodendrum bethunianum* Low; *Clerodendron squamatum* var. *esquamatum* Backer is *Clerodendrum scopiferum* Miq.; *Clerodendron squamatum* var. *japonicum* Hassk. is *Clerodendrum japonicum* (Thunb.) Sweet; *Clerodendron squamatum* var. *javanicum* Teijsm. is *Clerodendrum japonicum* (Thunb.) Sweet; *Clerodendron squamatum* var. *rumphianum* (DeVriese) Bakh. is *Clerodendrum rumphianum* DeVriese & Teijsm.; *Clerodendron squamatum* var. *scopiferum* H. J. Lam and var. *scopiferum* (Miq.) H. J. Lam are *Clerodendrum scopiferum* Miq.; *Clerodendron squamatum* var. *typica* Bakh. is *Clerodendrum japonicum* (Thunb.) Sweet; *Clerodendron squamatum* var. *urticifolia* C. B. Clarke and var. *urticifolium* Hook. f. are *Clerodendrum urticifolium* (Roxb.) Wall.; *Clerodendron squamatum* ♀ *indicum* Hassk. is *Clerodendrum speciosissimum* Van Geert; and *Clerodendron squamatum verum* Hort. ex Morr. is *Clerodendrum speciosissimum* Van Geert.

Clerodendrum japonicum (Thunb.) Sweet and *C. kaempferi* (Jacq.) Sieb. are the two red-flowered squamulose-leaved species most often confused. They may usually be distinguished as follows:

1. Calyx in anthesis 10--15 mm. long; corollas 2--3 cm. long..... *C. japonicum.*

1a. Calyx in anthesis less than 10 mm.long; corollas over 3 cm. long *C. kaempferi.*

It should be noted that populations of *Clerodendrum kaempferi* in the New World usually have the terminal panicles much denser, with shorter sympodia and more shortly stipitate cymes, and the axillary cymes much shorter-pedunculate than in *C. japonicum.*

Keys to help distinguish *C. kaempferi* from other cultivated taxa in this genus will be found under *C. bethunianum* Low in the present series of notes [58: 195--198], from other Madagascar taxa under *C. baronianum* Oliv. [58: 184--194], from Indian and Hawaiian taxa under *C. indicum* (L.) Kuntze [61: 23--25], from other Assam species under *C. griffithianum* C. B. Clarke [60: 134--136], from other Chinese taxa under *C. canescens* Wall. [58: 416], from other Indochinese species under *C. hahnianum* Dop [60: 141--143], and from other Indonesian taxa under *C. klemmei* Elm.

Among the inaccuracies and errors in the literature of *C. kaempferi* may be noted the following: the Angely (1971) work is often mis-cited as "1970", the titlepage date. Similarly, the Hooker & Arnott (1836) work is often mis-cited as "1841", but pages 193--288 were actually issued in 1836. The Jacquin (1792) work is dated "1793" by Bretschneider (1898) and by Makino (1903) and as "1789",

"1791", or "1797" by other authors.

The Dietrich (1842) reference is very often cited as "1843" -- including by myself in previous installments of the present series - but actually all of the volume here involved was published between December 29 and 31, 1842.

Hallier (1918) dates the Miquel (1858) reference as "1856", but pages 705--960 were actually not issued until 1858. Yamazaki (1966) cites the Hara (1918) reference as "1949".

The Siebold (1830) reference occurs on a page with the printed number "51", but this is a typographic error (often used by authors) -- it should read "31", as can be seen plainly from the numbers of the next succeeding correctly numbered pages. Siebold & Zuccarini (1846) mistakenly cite the Willdenow (1800) reference as "p. 358", instead of page 385.

In 1892 a writer, who signed himself merely as "W. W.", provided a description and two illustrations of what he called *C. kaempferi* -- the line drawing appears to represent *C. japonicum* (Thunb.) Sweet while the splendid full-color plate seems to represent *C. paniculatum* L.

Pal & Krishnamurthi (1967) describe the leaves of the species here being discussed as "incised"; Pételot (1953) refers to them as "hastées" and as "hispides" on the upper surface; How refers to them as "rough" -- none of these statements is applicable. Baines (1877) refers to the species as a "South American species", but, actually, it is surely an Asiatic species. Lam & Meeuse (1942) describe it as "a small straight tree, 3.5 m high, trunk 3 m", and in a few other places in the literature it is spoken of as a "tree" -- certainly by error. Pickles describes it as a "shrub 9 ft. x 6 in., bole with many stems arising from the ground, bark pockmarked, gray-green, outer bark soft, inner fibrous, patchy green and yellow; sapwood cream" -- again implying that the plant is arborescent. Levine refers to "pale blue-purple flowers" -- certainly incorrect: perhaps he is referring to the fruit.

Miquel (1865) cites an unnumbered Pierot collection from "nangasaki", Japan; Hallier (1918) cites *Zollinger 2557* from Java, *Elbert 2933* & *2994* and *DeVriese & Teijsmann s.n.* from Celebes, *Hallier 4257b* from Basilan, *Hallier 4257a* from Luzon, *Prain's Collector 46* from the Andaman Islands, and *Daalen 487* from Sumatra.

Lam (1919) cites *Buijsmann 74* from Java, *Herb. Bogor. 1163* and *Daalen 487* from Sumatra, and *Herb. Bogor. 2567* & *5301* from Celebes; Hu (1938) cites *Wang 78755* & *79782* from Yünnan, China; Pételot (1953) cites *Poilane 1132* from Vietnam; and Deb (1961) cites his *no. 299* from Manipur, India.

Material of *Clerodendrum kaempferi* has been misidentified and distributed in some herbaria as *C. bethuneanum* Hook. f., *C. bethunianum* Low, *C. cordatum* Don, *C. cordifolium* (Hochst.) A. Rich., *C. cordifolium* Roxb., *C. fallax* Lindl., *C. fragrans* Vent., *C. infortunatum* Gaertn., *C. intermedium* Cham., *C. kaempferi* Fisch., *C. paniculatum* L., *C. splendens* G. Don, and even as *Acanthaceae*.

On the other hand, the *Elmer 9763* & *14504*, *Foxworthy Philip. Bur. Sci. 786*, *Ramos & Edaño Philip. Bur. Sci. 39076*, and *Teijsmann 8502*,

distributed as *C. kaempferi*, actually are *C. bethunianum* Low, while *Boden-Kloss 1464a* and *Yates 848* are *C. buchanani* (Roxb.) Walp.; *Donggala 70, Elmer 17610, Tsang & al. 7674,* and *Usteri s.n.* [23/XII/02] are *C. intermedium* Cham.; *Chang 4134, Chiao 1495, Ching 1900 & 5193, Chung 2351 & 2893, Franck 150, Henry 12060, Herb. Canton Chr. Coll. 12540, Herb. Hort. Bot. Calcutt. s.n.* [23/XII/1937], *Herb. Univ. Nanking 14694, Kreuzpointner s.n.* [Herb. Hort. Monac. 12 Oct. 1886], *Peng & al. 541, Pi 6133, Pradham & Ihapa 6437,* and *Savatier s.n.* [Yedo] are *C. japonicum* (Thunb.) Sweet; *Stevens 453* is *C. paniculatum* L.; *Koorders 20647b, Meebold s.n.* [Oahu, 8.1941], and *Vaupel 13* are *C. speciosissimum* Van Geert; *Ching 5193, Chun 104, Dee 578, Franck 173, Herb. Roy. For. Dept. 7775, McClure 8854,* and *Tsui 306* are *C. urticifolium* (Roxb.) Wall.; and *Kazmi s.n.* [19.1.52] is not verbenaceous. *Chun 5007* is a mixture of *C. kaempferi* and *C. fortunatum* L.; *Lam 2775* consists only of leaves and so its identification with this species is tentative and problematic.

It may be worth mentioning here that the "*C. japonicum*" of Holthuis & Lam (1942) and of Lam (1945) probably is a misidentification for *C. kaempferi*. On the other hand, the "*C. kaempferi*" or "*C. squamatum*" of Kwa-wi (1759), Banks (1791), Regel (1856, 1880), Baines (1881), Lubbock (1892), Wilson (1912), and Corner & Watanabe (1969) probably is *C. japonicum*, while that of Lindley (1844) and Hargreaves (1958) probably is *C. speciosissimum* Van Geert; and that of "W. W." in Garden [Lond.] (1892) is probably *C. paniculatum* L.

Citations: FLORIDA: Dade Co.: *Avery 1238* (Ac, Lc, Ld, Tu). *1289* (Ac, Ld, Ws). BRAZIL: Amazonas: *Lafroy s.n.* [Environs de Manaos] (P). Paraná: *Dusén 8870* (B, Ld--photo, N--photo, S, S, W--148182, W--1481822). Rio de Janeiro: *Carauta 58* [Herb. FEEMA 18413] (Fe); *Luetzelburg 6900* (B, Mu, V); *Patschke 201* (B). RÉUNION ISLAND: *Bernier s.n.* (P). NEPAL: *Shrestha & Bista 1784* (W--2581502); *Stainton, Sykes, & Williams 6887* (Bm). INDIA: Sikkim: *J. D. Hooker s.n.* [2-5000 ped., Sikkim] (L, Pd); *T. Thomson s.n.* [Sikkim] (L, Pd); *Treutler 289* (L); *Wallich s.n.* (S). West Bengal: *C. B. Clarke 9102* (L), *35350F* (L), *35350G* (X); *Herb. Swartz s.n.* (S). State undetermined: *Griffith 6051/1* [East Himalayas] (L, Mu--865); *Roxburgh s.n.* (Br). SRI LANKA: *Sumithraarachchi DBS.509* (Ac, Gz, Lc, Ld, N, N, Tu, W--2807771, Ws). BURMA: Tenasserim: *Wallich 1789/1* (L, L). ANDAMAN ISLANDS: South: *Kurz s.n.* (K); *Prain's Collector 46* (Br). CHINA: Fukien: *DeGrijs 396* (S). Kwangtung: *Bladh s.n.* (S); *Chun & Ting 445* (Ac); *C. C. Levine Herb. Canton Chr. Coll. 735* (Ph, W--779008); *Tsiang 2123* (N); *Tsui 306* (W--1754589); *Ying 853* (Ca--358913). CHINESE OFFSHORE ISLANDS: Hainan: *Chun & Tso 43442* (N, W--1669521); *C. Ford s.n.* [15-6-93] (W--456057); *Gressitt 826* (I); *Hancock 20* (L); *How 70751* (N); *Lei 196* (B, Ba), *805* (B, Ba, Bz--19735, Mi, N, W--1754349); *Liang 61548* (N), *61983* (N); *Tak [Tsang] 25* [Herb. Lingnan Univ. 15524] (Ca--315764, W--1248870), *98* [Herb. Lingnan Univ. 16847] (Ca--356630, W--1659518); *C. Wang 32835* (N); *Wu 1089* (Ca--358996). HONG KONG: *Chun 5007* in part (Du--200923). THAILAND: *Bunpheng 857* (Ld); *Congdon 734* (Ac); *Dee 578* [Herb. Roy. For. Dept. 7775] (Ld); *Larsen & Larsen 34222* (Ac, Ld). VIETNAM: Annam: *F. A. McClure 771* [Herb. Canton Chr. Coll. 7284] (S). Tonkin: *Eberhardt*

4911 (B). MALAYA: Malacca: *Herb. Harvey s.n.* [Malacca, 1816] (Du--166594). Singapore: *N. J. Andersson s.n.* [28 Jan. 1853] (S). TAIWAN: *Gressitt 45* (N); *Katsumada 21952* (Ca--322498); *Ream 543* (Ws); *Tanaka & Shimada 10974* (Go). PHILIPPINE ISLANDS: Luzon: *Mendoza 1518* [Philip. Nat. Herb. 18525] (W--2214791). Negros: *Elmer 9763* (Bz--20625); *Herb. Usteri s.n.* [23/XII/02] (N). GREATER SUNDA ISLANDS: Bawean: *Buwalda 3342* (Bz--72911). Celebes: *Kaudern 47* (N, N, S), *193* (N, S); *Kjellberg 342* (S); *Posthumus 2474* (Bz--20638); *Rachmat s.n.* [Vuuren 562] (Bz--20643, Bz--20644); *Smith 650* (Bz--20651), *651* (Bz--20652). Kava: *Osbeck s.n.* (S). Sabah: *Yates 16* (W--129147). Sarawak: *Pickles 2952* (W--2376942). Sumatra: *Blinnemeijer 485* (Bz--20694), *571* (Bz--20673, Bz--20674), *3388* (Bz--20690), *3756* (Bz--20697), *4147* (Bz--20691); *Daalen 487* (Bz--20677, Bz--20678); *Lörzing 3536* (Bz--20693); *Teijsmann 2217 H.B.* (Bz--20679); *Van Steenis 3237* (Bz--20685); *Voogd 1314* (Bz--20682, Bz--20683); *Yates 2525* (Ca--318346, Du--200922). TALAUD ISLANDS: Karakalang: *Lam 2775* (Bz--20668, Bz--20669). CULTIVATED: Austria: *Herb. Jacquin s.n.* [Macbride photos 34295] (F--976305--photo of type, Kr--photo of type, N--photo of type, V--type, V--isotype, V--isotype, V--isotype); *Herb. Portenschlag s.n.* (V). Brazil: *Araujo & Angely 1328* [Herb. FEEMA 12338] (Fe); *Bailey & Bailey 238* (Ba, Ld--photo, N--photo); *Carauta 480* [Herb. Cent. Pesq. Florest. 5474] (Fe); *Dierberger s.n.* [Herb. Inst. Bot. S. Paulo 34718] (N, Sp); *Hatschbach 34848* (Ba--371331); *A. Lutz 588* (Lz); *Mello Barreto 4386* [Herb. Jard. Bot. Belo Horiz. 13060] (F--909819); *Pickel 1836* (Sf); *Reitz 6874* (W--2534996). England: *Herb. Hort. Anglic. s.n.*[1816] (B); *Herb. Sprengel s.n.* [Hort. Kew.] (B); *Herb. Veitch's Nursery s.n.* [Sept. 4, 1884; type of C. *illustre*] (K). France: *Herb. Martius s.n.* [H. B. Paris 1842] (Br). Hong Kong: *Woo & Woo 287* (Mi); *C. Wright s.n.* (W--44912). India: *Herb. Hort. Bot. Calcutt. s.n.* (Le, Mu--864, Mu--1153, T); *Herb. Martius s.n.* [H.B.C.] (Br); *Voigt s.n.* [H. B. Seramp.] (Cp, Cp, Cp); *Wallich 1798* (B, K, K), *1798/A* (V), *1798/1* (B, B, B), *6050/1* (B), *s.n.* (Cp). Java: *Herb. Hort. Bot. Bogor. XV.J.A.XXXII.8* (Bz--26384, Bz--26385), *XV.J.A.XXXII.8a* (Bz--26397). Kulungsu Island: *Chung 1672* (Ca--224957). Mauritius: *Bojer s.n.* (K, K); *Herb. Hooker s.n.* (K). Sri Lanka: *Collector undetermined s.n.* [Roy. Bot. Gard. 1887] (Pd); *Moldenke, Moldenke, & Jayasuriya 28161* (Ld, Pd, W-2764402); *Moldenke, Moldenke, Jayasuriya, & Sumithraarachchi 28172* (W--2764559), LOCALITY OF COLLECTION UNDETERMINED: *Collector undetermined s.n.* [24th June 1802] (Pd), *s.n.*(L); *Herb. Petit-Thouars s.n.* (P). MOUNTED ILLUSTRATIONS: Edwards, Bot. Reg. 8: pl. 649. 1822 (B); Fang, Icon. Pl. Omeien. 1: pl. 69. 1944 (Ld); Neal, In Homolulu Gard. 271, fig. 59e. 1928 (Ld); Lodd., Bot. Cab. 8: pl. 796. 1823 (N); Pynaert, Rev. Hort. Belg. 22: 253. 1896 (Ld); unidentified color plate (Ba).

CLERODENDRUM KAEMPFERI f. *ALBUM* (P'ei) Mold., Phytologia 58: 196. 1985; stat. nov.

Synonymy: *Clerodendron japonicum* var. *album* P'ei, Mem. Sci. Soc. China 1 (3): 144. 1932. *Clerodendrum kaempferi* var. *album* (P'ei) Mold., Phytologia 1: 167. 1935.

Bibliography: P'ei, Mem. Sci. Soc. China 1 (3): 144. 1932; Mold., Phytologia 1: 167. 1935; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 57 & 90 (1942) and ed. 2, 131 & 182. 1949; Mold., Alph. List Cit. 4: 1011. 1949; Mold., Résumé 169, 193, & 450. 1959; Patel, Fl. Melghat 269. 1968; Mold., Fifth Summ. 1: 288 & 322 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 277, 313, & 538. 1980; Mold., Phytologia 58: 196. 1985.

This form differs from the typical form of the species in having white corollas.

The form is based on *Tsiang 2506* from North Gate, Kochow, Kwangtung, China, collected in May, 1929. The collector describes it as an undershrub, the leaf-blades deep-green above, light-green beneath and the corollas white. Slooten found what appears to be the same form in Borneo.

A key to distinguish this taxon from cultivated taxa, assuming that it will eventually appear in cultivation, will be found under C. *bethunianum* Low in the present series of notes [58: 195--198].

Citations: GREATER SUNDA ISLANDS: Kalimantan: *Slooten 2165* (Bz--20598).

CLERODENDRUM KAEMPFERI f. *SALMONEUM* Mold., Phytologia 34: 18. 1976.

Bibliography: Patel, Fl. Malghat 269. 1968; Mold., Phytologia 34: 18 & 264. 1976; Hocking, Excerpt. Bot. A.30: 419. 1978; Mold., Phytol. Mem. 2: 284 & 538. 1980; Mold., Phytologia 58: 196. 1985.

This form differs from the typical form of the species in having the corollas salmon-pink or rose in color.

The form is based on *Larsen & Larsen 34181* from Khun Yuam, Maehongson, in northern Thailand, at 600--700 m. altitude, collected on September 5, 1974, and deposited in the Herbarium Jutlandicum at Aarhus University.

Patel (1968) mentions what is probably this same color form as growing in Melghat, India, where he implies that it is cultivated in gardens "for its flowers". A key to help distinguish it from other cultivated taxa in this genus will be found under C. *bethunianum* Low in the present series of notes [58: 195--198].

Citations: THAILAND: *Larsen & Larsen 34181* (Ac--type).

CLERODENDRUM KALAOTOENSE H. J. Lam, Verbenac. Malay. Arch. 307--308 [as "*Clerodendron*"]. 1919; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 66 & 90 [as "*kalaotoënse*"]. 1942.

Synonymy: *Clerodendron kalaotoense* H. J. Lam, Verbenac. Malay. Arch. 307. 1919. *Clerodendron kalaotoënse* H. J. Lam apud A. W. Hill, Ind. Kew. Suppl. 6: 49. 1926. *Clerodendron kalaotense* H. J. Lam apud Fedde & Schust., Justs Bot. Jahresber. 47 (2): 245. 1927. *Clerodendrum kalaotoënse* H. J. Lam ex Mold., Known Geogr. Distrib. Verbenac., ed. 1, 66 & 90. 1942

Bibliography: H. J. Lam, Verbenac. Malay. Arch. 307--308 & 364. 1919; Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 95, 109, & IX. 1921; A. W. Hill, Ind. Kew. Suppl. 6: 49. 1926; Fedde & Schust., Justs Bot. Jahresber. 47 (2): 245. 1927; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 66 & 90 (1942) and ed. 2, 146, 147,

& 182. 1946; Mold., Résumé 194, 196, & 450. 1959; Mold., Fifth Summ. 1: 322 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 313 & 533. 1980; Mold., Phytologia 61: 270. 1986.

A shrub, about 2 m. tall; branches subtetragonal, appressed-puberulent; leaves decussate-opposite; petioles 2--6.5 cm. long, appressed-puberulent; leaf-blades subchartaceous, ovate, 10.5--18 cm. long, 5.5--9.5 cm. wide, apically acute, marginally entire, basally attenuate, pubescent on both surfaces but especially beneath and on the venation; secondaries 6 or 7 per side; panicle terminal, foliose, 16--17 cm. long, 12--20 cm. wide, appressed-puberulent or pubescent; peduncles absent or to 2.5 cm. long and appressed-puberulent; bractlets minute, linear, about 2 mm. long; pedicels 7--12 mm. long, slender, appressed-puberulent; calyx about 7 mm. long, externally densely appressed-pubescent, internally sparsely so, 5-lobed, the lobes lanceolate, 4 mm. long; corolla white, its tube 4 cm. long, slender, glabrous, the lobes elliptic, 7 mm. long, 3.5 mm. wide, dorsally puberulent; stamens and style exserted about 2.5 cm. from the corolla-mouth; stigma shortly bifid; ovary externally glabrous; fruit not known.

This species is based on *Docters van Leeuwen-Reijnvaan 1373* from 150 m. altitude on Kalao-Toa Island, southwest of Celebes, Indonesia, collected in anthesis on May 6, 1913. Lam (1919) remarks that "This species is closely allied to *C. ingratum*. It has, however, much larger leaves and its calyx and corolla-lobes are smaller, whilst the corolla-tube is glabrous without".

Nothing is known to me of this species beyond what is stated in its meager bibliography (above).

CLERODENDRUM KALBREYERI J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 295 & 311 [as "*Clerodendron*"]. 1900.

This binomial, previously regarded as valid for a distinct species in many of my previous publications, now proves to be nothing more than a synonym of *C. violaceum* Gürke, which see.

CLERODENDRUM KAMPOTENSE Dop in Lecomte, Notul. Syst. 4: 8 [as "*Clerodendron*"]. 1920; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 59 & 90. 1942.

Synonymy: *Clerodendron kampotense* Dop in Lecomte, Notul. Syst. 4: 8. 1920.

Bibliography: Dop in Lecomte, Notul. Syst. 4: 8. 1920; A. W. Hill, Ind. Kew. Suppl. 6: 49. 1926; Fedde & Schust., Justs Bot. Jahresber. 48 (1): 497. 1927; Dop in Lecomte, Fl. Gén. Indo-chine 4: 853 & 879--880. 1935; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 59 & 90 (1942) and ed. 2, 136 & 182. 1949; Mold., Résumé 175 & 450. 1959; Mold., Fifth Summ. 1: 300 (1971) and 2: 867. 1971; Mold., Phytologia 31: 395. 1975; Mold., Phytol. Mem. 2: 288, 387, & 538. 1980; Mold., Phytologia 60: 143. 1986.

A branching shrub; branches pendent, brown, striate, finely pubescent; leaves decussate-opposite; petioles slender, 6 cm. long, pubescent; leaf-blades elliptic or elliptic-oblong to oval, membranous or subchartaceous, 14 cm. long, 6 cm. wide, apically short-acum-

inate and apiculate, marginally subentire, basally obtuse or rounded to truncate, glabrous above, slightly pubescent on the venation beneath; midrib rounded, prominent; secondaries 10--12, thin, arcuate; tertiaries irregular; veinlet reticulation very delicate; inflorescence terminal, paniculate, large, foliose, pyramidal, to 30 cm. long and 18 cm. wide, the ramifications rebranched, 5 cm. long, terminally trichotomous, the cymes 5--7-flowered; bracts foliaceous, elliptic or lanceolate, stipitate, persistent; bractlets linear, small; pedicels 6--10 mm. long; calyx campanulate, red, 8--9 mm. long, glabrous, the tube 4 mm. long, the lobes oval, 4 mm. long, basally 2 mm. wide, apically acute, nervate; corolla white, 2.4--2.5 cm. long, glabrous, the tube 1.5 cm. long, apically dilated, the lobes spatulate, 1 cm. long, apically obtuse; stamens long-exserted; filaments glabrous; anthers oblong; style slender; stigma shortly bifid; ovary externally glabrous; fruiting-calyx accrescent, 1.5 cm. wide, the lobes reflexed; fruit drupaceous, black, shiny, 1 cm. long.

This species is based on *Geoffray 284* and *284bis* from woods at the foot of Mt. Kamchay, Kampot, Cambodia, and is known only from the original collections. A key to help distinguish it from other Indochinese species will be found under *C. hahnianum* Dop in the present series of notes [60: 141--143]. Nothing is known to me of it beyond what is stated in its bibliography (above).

CLERODENDRUM KANICHI DeWild., Ann. Mus. Congo Bot., ser. 4, 1: 119 [as "*Clerodendron*"]. 1903; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 80 & 94. 1936.

Synonymy: *Clerodendron kanichi* DeWild., Ann. Mus. Congo Bot., ser. 4, 1: 119. 1903. *Clerodendrum canichi* Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 25 sphalm. 1936.

Bibliography: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Étude Pl. Katang.] 119, pl. 37. 1903; Prain, Ind. Kew. Suppl. 3, imp. 1, 44. 1908; DeWild., Syll. Fl. Congol. 439. 1909; Stapf, Ind. Lond. 2: 238. 1930; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 25, 80, & 94. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 48 & 90 (1942) and ed. 2, 115 & 182. 1949; Prain, Ind. Kew. Suppl. 3, imp. 2, 44. 1958; Mold., Résumé 141 & 450. 1959; Mold., Fifth Summ. 1: 229 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 219 & 538. 1980.

Illustrations: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Étud. Pl. Katang.] pl. 37. 1903.

This species is based on *Verdick 323* from Lukafu, Katanga, Zaire, collected in December, 1899, deposited in the Brussels herbarium. Thomas (1936) cites only the original collection and makes this species the type species of his Section *Oligocymosa* Thomas in Subgenus *Cyclonema* (Hochst.) Gürke.

Collectors have encountered this plant on savannas, referring to it as a bush, and have found it in anthesis in October and December. "Kanichi" is said to be the vernacular name for the plant in Zaire.

Citations: ZAIRE: *Beurieß 753* (Br, Br, N); *Lynes 140* (Br); *Verdick 323* (Br--type, Ld--photo of type, N--photo of type). MOUNTED ILLUSTRATIONS: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: pl. 37. 1903 (N),

CLERODENDRUM KATANGENSE DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Etude Fl. Katang.] 120, pl. 38 [as "*Clerodendron katangensis*"]. 1903; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 48, 88, & 94. 1936.

Synonymy: *Clerodendron katangensis* DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Étude Fl. Katang.] 120. 1903.

Bibliography: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Étude Fl Katang.] 120, pl. 38. 1903; Prain, Ind. Kew. Suppl. 3, imp. 1, 44. 1908; Stapf, Ind. Lond. 2: 238. 1930; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 48, 88, & 94. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 48 & 90 (1942) and ed. 2, 115 & 182. 1949; Prain, Ind. Kew. Suppl. 3, imp. 2, 44. 1952; Mold., Résumé 141 & 450. 1959; Mold., Résumé Suppl. 12: 5 & 6. 1965; Mold., Fifth Summ. 1: 229 & 242 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 219, 232, & 538. 1980.

Illustrations: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Étude Fl. Katang.] pl. 38. 1903.

This species is based on *Verdick 400* from the borders of the Mwena, Katanga, Zaire, collected in March, 1900, and deposited in the Brussels herbarium.

Collectors have found this plant in anthesis in January and March and report the vernacular name, "kakope", for it. It is a member of the Section *Chaunocymosa* Thomas in Subgenus *Cyclonema* (Hochst.) Gürke. Thomas (1936) cites only the type collection.

Citations: ZAIRE: *Verdick 400* (Br--type, Ld--photo of type, N--photo of type). ANGOLA: Moxico: *Barros Machado 125* (Ul). MOUNTED ILLUSTRATIONS: DeWild., Ann. Mus. Congo Bot., ser. 4, 1: [Etude Fl. Katang.] pl. 38. 1903 (N).

CLERODENDRUM KAUDERNI Mold., Amer. Journ. Bot. 38: 326. 1951.

Bibliography: Mold., Amer. Journ. Bot. 38: 326. 1951; Mold., Biol. Abstr. 26: 185. 1952; Mold. in Humbert, Fl. Madag. 174: 154, 229, 230, & 268, fig. 37 (3). 1956; Mold., Résumé 155 & 450. 1959; G. Taylor, Ind. Kew. Suppl. 12: 36. 1959; Mold., Fifth Summ. 1: 260 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 249 & 538. 1980; Mold., Phytologia 57: 469 (1985) and 58: 189. 1985.

Illustrations: Mold. in Humbert, Fl. Madag. 174: 229, fig. 37 (3). 1956.

A shrub or small forest tree, to 6.5 m. tall; branchlets and twigs rather irregular, slender, glabrous; nodes not annulate; principal internodes rather regular, 2--5 cm. long; leaves decussate-opposite, borne only on the twigs; petioles slender, 5--9 mm. long, ampliate in disciform fashion at the base (in drying), canaliculate above and pilosulous in the channel, otherwise glabrous; leaf-blades rather uniformly green on both surfaces or slightly lighter beneath, submembranous or very thin-chartaceous, brunnescent in drying, lanceolate-elliptic or elliptic, 3--5 cm. long, 1--2.3 cm. wide, apically varying from acute or obtuse to rounded or subacuminate, marginally entire or with a single pair of rounded teeth near the apex, glabrous on both surfaces or pilosulous on the midrib above; midrib slender, flat above, prominulent beneath; secondaries

filiform, 5--7 per side, arcuate-ascending, mostly flat or even obscure on both surfaces, arcuately joined in loops several mm. from the margins; vein and veinlet reticulation obscure or indiscernible on both surfaces; inflorescence axillary, cymose, the cymes usually 2- or 3-flowered, at the tips of the twigs only; peduncles none; pedicels very slender, about 5 mm. long, puberulent; calyx obconic-campanulate, 3--4.5 mm. long, very minutely puberulent or glabrescent, its rim very shortly 4-denticulate; corolla hypocrateriform, the tube very narrowly cylindric, 2.5--2.8 cm. long, externally glabrous, apically slightly ampliate, the limb less than 1 cm. wide; stamens and pistil exserted less than 1 cm. from the corolla-mouth; fruit drupaceous, crimson-red.

This endemic species is based on an unnumbered W. Kaudern collection from Majunga in western Madagascar, collected in July, 1912, and deposited in the Stockholm herbarium.

A key to help distinguish this species from other Madagascar taxa will be found under *C. baronianum* Oliv. in the present series of notes [58: 184--190].

Citations: MADAGASCAR: *Kaudern s.n.* [Catrèpe, May 1912] (N, S), *s.n.* [Majunga, July 1912] (F--photo of type, Ld--photo of type, N--photo of type, S--type, Sg--photo of type); *G. W. Parker s.n.* (K).

CLERODENDRUM KIANGSIENSE Merr. ex Li, Journ. Arnold Arb. 25: 426--427 [as "*Clerodendron*"]. 1944; Mold., Alph. List Inv. Names Suppl. 1: 6. 1947.

Synonymy: *Clerodendron kiangsiense* Merr. ex Li, Journ. Arnold Arb. 25: 426. 1944. *Clerodendron kwangsiense* Merr. ex Mold., Resume Suppl. 3: 30 in syn. 1962.

Bibliography: P'ei, Mem. Sci. Soc. China 1 (3): 152. 1932; Li, Journ. Arnold Arb. 25: 426--427 & 507. 1944; Mold., Alph. List Inv. Names Suppl. 1: 6. 1947; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 131 & 182. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 56. 1953; Mold., Résumé 169, 265, & 450. 1959; Mold., Résumé Suppl. 3: 30. 1962; Mold., Fifth Summ. 1: 288 & 448 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 277 & 538. 1980.

A shrub, sometimes arborescent, 2.5--3 m. tall; branchlets densely brown-puberulent, not lenticellate; leaves decussate-opposite; petioles 2--4.5 cm. long, puberulent; leaf-blades chartaceous, ovate-oblong, 9.5--12 cm. long, 5.5--7 cm. wide, apically acuminate, marginally entire, basally subtruncate, sparsely puberulent on both surfaces; secondaries 4--6 per side, slight conspicuous above, prominent beneath; veinlet reticulation inconspicuous above, prominulent beneath; inflorescence cymose-paniculate, to 10 cm. long; peduncles 5.5--6 cm. long, puberulent; bracts foliaceous, oblong, 8--9 mm. long, 3--4 mm. wide, apically acuminate, puberulent, scattered-glandulose; flowers more or less crowded; pedicels 1--2 mm. long; bractlets linear, 2--3 mm. long; calyx campanulate, 5--6 mm. long, puberulent, inconspicuously scattered-glandulose, the rim 5-dentate; corolla hypocrateriform, white or pinkish, its tube slender, 1.2--1.5 cm. long, scarcely 1 mm. wide, apically scattered-puberulent, basally glabrous, the lobes mostly oblong, 5--7 mm. long, 1.5--3 mm.

wide, dorsally more or less puberulent; stamens exserted about 1 cm. from the corolla-mouth; style exserted about 1 cm.; stigma 2-lobed, the lobes apically acute.

This species is based on *J. L. Gressitt 1554* from 400 m. altitude between Kit-than and Sungwu in southern Kiangsi, China, collected on July 1, 1936, and deposited in the Arnold Arboretum herbarium at Jamaica Plain, Massachusetts.

Li (1944) comments that "This species is near *Clerodendron kwangtungense* Hand.-Mazz., differing in the more compactly arranged flowers, in the puberulent and glandular calyces and bracts, and in the absence of lenticels. *Chung 2021* of Pangyung, Chekiang, referred by P'ei....to *Clerodendron kwangtungense* Hand.-Mazz. undoubtedly represents the same species."

Collectors have found *C. kiangsiense* growing in light woods, at 115--400 m. altitude, in flower in June and July. The corollas on the type collection are said to have been "white", while those on the Tsiang collection, cited below, were "pinkish" when fresh.

Material of *C. kiangsiense* has been misidentified and distributed in some herbaria as *C. kwangtungense* Hand.-Mazz. and as *C. trichotomum* Thunb.

Citations: CHINA: Chekiang: *Ching 2021* (Ca--281764). Kiangsi: *Tsiang 9816* (N).

CLERODENDRUM KIBWESENSE Mold., Phytologia 4: 48--49. 1952.

Bibliography: Mold., Biol. Abstr. 26: 1471. 1952; ,old., Phytologia 4: 48--49. 1952; Mold., Résumé 144, 150, & 450. 1959; G. Taylor, Ind. Kew. Suppl. 12: 36. 1959; Mold., Fifth Summ. 1: 235 & 251 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 225, 240, & 538. 1980; Holmgren & al., Ind. Vasc. Pl. Type Microf. 441. 1985.

A shrub, to 3 m. tall; branchlets slender, very obscurely tetragonal, very lightly pulverulent-puberulent, more densely so on the youngest parts; principal internodes 2--6 cm. long; nodes only faintly annulate or not annulate; leaves decussate-opposite; petioles very slender, 1--1.5 cm. long, pilose-pubescent with brownish hairs; leaf-blades membranous, somewhat lighter beneath, brunnescent in drying, elliptic, 4--6 cm. long, 1.5--3 cm. wide, apically rounded to a very slight apiculation, marginally entire or subentire, basally acute, rather densely short-pubescent on both surfaces; midrib slender, prominent beneath; secondaries few, filiform, mostly about 4 per side, distant, arcuate-ascending, flat above, very slightly subprominulous beneath; veinlet reticulation abundant but rather obscure on both surfaces; inflorescence terminal, paniculate, consisting of 1 or 2 pairs of lateral and a terminal cyme; peduncles slender, obscurely tetragonal, 2.5--4 cm. long, very finely puberulent; sympodia and inflorescence-branches very slender, often stramineous, sulcate or compressed, microscopically puberulent or glabrescent; pedicels filiform, about 1 mm. long, microscopically puberulent; calyx campanulate, about 2 mm. long, microscopically puberulent or glabrate, its rim deeply 5-lobed, the lobes about as long as the tube; corolla very small, about 4 mm. long; fruiting-calyx broadly campanulate, about 3 mm. long and 4 mm. wide, externally minutely puberulent, its lobes ovate, erect-spreading, apically a-

cute; fruit drupaceous, small.

This species is based on *Scheffler 62* from a sunny thick-bush steppe, on red laterite soil, at Kibwesi, Ukambani, at about 1000 m. altitude, Tanganyika (Tanzania), collected on January 28, 1906, and deposited in the Brussels herbarium. The plant has much the same aspect as a *Premna*, but was placed by Berthold Thomas in "*Clerodendrum* cfr. Sektio *Microcalyx*". Hornby describes it as a "large shrub in rocky kopje", in fruit in January.

Citations: TANZANIA: Tanganyika: *Scheffler 62* (Br--type, Ld--photo of type, N--fragment of type, N--photo of type, S--isotype). MOZAMBIQUE: Moçambique: *Hornby 2499* (Af).

CLERODENDRUM KINABALUENSE Stapf, Trans. Linn. Soc. Lond., ser. 2, 4: 216 [as "*Clerodendron*"]. 1894; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 64 & 90. 1942.

Synonymy: *Clerodendron kinabaluense* Stapf, Trans. Linn. Soc. Lond., ser. 2, 4: 216. 1894. *Clerodendron disparifolium* var. *kinabaluense* (Stapf) Bakh. ex Mold., Résumé 272 in syn. 1959. *Clerodendron disparifolium* var. *kinabaluense* f. *clementium* Bakh., in herb.

Bibliography: Stapf, Trans. Linn. Soc. Lond., ser. 2, 4: 121 & 216 (1894) and 4: 522. 1896; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 101. 1901; H. J. Lam, Verbenac. Malay. Arch. 279 & 364. 1919; Bakh. in La, & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 83, 109, & IX. 1921; E. D. Merr., Bibl. Enum. Born. Pl. 517. 1921; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 101. 1941; Mold., Known Geogr. Distrib. Verbenac., ed 1, 64 & 90 (1942) and ed. 2, 145 & 182. 1949; Mold., Alph. List Cit. 4: 1204. 1949; Durand & Jacks., Ind. Kew., imp. 3, 101. 1959; Mold., Résumé 192, 262, 265, & 450. 1959; Mold., Fifth Summ. 1: 322, 443, & 448 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 313 & 538. 1980; Mold., Phytologia 59: 330 (1986) and 60: 180. 1986.

A slender shrub or undershrub, 1.5 m. tall; young branches densely spreading-hirtellous or hirsute, later glabrescent, with pale bark; leaves decussate-opposite, equal; petioles slender, 2.5--4 cm. long, sparsely puberulent sometimes constricted above the base and below the apex; leaf-blades oblanceolate or lanceolate-oblong, 15--25 cm. long, 5--6.5 cm. wide, apically acuminate, marginally repand-serrulate, at first scattered-setulose with minute setae above which are finally deciduous except for their bases, tawny-pubescent or fuscous-puberulent on the venation beneath; secondaries 11--13 per side; inflorescence terminal, paniculate, to 20 cm. long, 10--13 cm. wide, erect, spreading-pubescent or puberulent, the ramifications subtended by lanceolate to filiform bracts, the cymes lax, 2--5-flowered; pedicels 8--18 mm. long; calyx 5-parted, the segments lanceolate, 8--13 mm. long during anthesis, apically acute or attenuate-acute, pubescent, finally accrescent; corolla hypocrateriform, white, the tube slender, 1.2--2 cm. long, pilosulous or pubescent, the lobes subequal, subspatulate, apically apiculate; stamens and style exserted 1.8--2 cm. from the corolla-mouth; fruiting-calyx red and showy; fruit drupaceous, dark-blue.

This species is based on *Haviland 1307* from 3200 feet altitude at

Penokok, Mount Kinabalu, Sabah, Indonesia. Stapf (1894) says of it: "Allied to C. *disparifolium*, Blume, C. *Griffithianum*, C. B. Clarke, and C. *calamitosum*, but distinct by the long leaves; from the first also by the much larger calyx, and from the second by the shorter corolla-tube. C. *obtusidens*, Miq., of which I do not know the type, has the calyx only half as long, according to the description. There are in the Herbarium several closely-allied species from North Borneo, but all undescribed."

Lam (1919) notes that "As Stapf mentions that this species is allied to C. *disparifolium*, C. *calamitosum* and C. *Griffithianum*, it may be that it had better be brought to the subsection *Axilliflora*. But as Stapf speaks only of a 'terminal panicle' we provisorily placed it among the *Paniculata*." He cites only the type collection, although without definite collector or number.

Collectors have encountered *Clerodendrum kinabaluense* in rainforests on mountains with steep slopes, at 1400--2300 m. altitude, in flower in February and May, and in fruit in November. Clemens reports it "not infrequent locally".

The corollas are said to have been "white" on *Nooteboom 920*.

Material of this species has been identified and distributed in some herbaria as "aff. C. *pendulifl orum* Wall." On the other hand, the *Clemens 10087* & *31262* and *Hallier 2934*, distributed as C. *kinabaluense*, actually are C. *haematolasium* H. Hallier, the latter being the type collection.

Citations: GREATER SUNDA ISLANDS: Sabah: *M. K. Clemens 50525* (N); *Clemens & Clemens 4967b* (Bz--19206), *s.n.* [May 20, '32] (Bz--19207, Ld--photo, N--photo), *s.n.* [Marai Parai, March 27, '33] (N); *Nooteboom 920* (Sn--1228509).

CLERODENDRUM KIRKII J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 299 [as "*Clerodendron*"]. 1900; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 73 & 94. 1936.

Synonymy: *Clerodendron kirkii* J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 299. 1900.

Bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 293 & 299. 1900; K. Schum., Justs Bot. Jahresber. 28 (1): 495. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 43. 1904; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 41, 73, & 94. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 51 & 90. 1942; H. N. & A. L. Mold., Pl. Life 2: 66. 1948; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 120 & 182. 1949; Mold., Résumé 149 & 450. 1959; Mold., Résumé Suppl. 9: 3. 1964; Mold., Fifth Summ. 1: 249 & 448 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 238 & 538. 1980; Mold., Phytologia 59: 335. 1986.

Baker's original (1900) description of this taxon is: "A shrub 4 ft. high, with pubescent branchlets. Leaves mostly ternate, shortly petioled, oblong, 2--3 in. long, acute or cuspidate, rounded at the base, deeply and irregularly crenate, moderately firm, thinly pubescent above, densely pubescent beneath. Cymes forming a lax small terminal panicle; pedicels short, pubescent. Calyx pubescent, 1/6 in. long; tube campanulate; teeth ovate, shorter than the tube.

Corolla white; tube cylindrical, ½ in. long; segments of the limb obovate, 1/8 in. long. Stamens three times the length of the corolla-lobes."

The species is based on an unnumbered Kirk collection from the upper Shire Valley, Malawi, collected in July of 1861, and deposited in the Kew herbarium. Baker (1900) and Thomas (1936) each cite only the original collection, the latter author placing the species in Section *Microcalyx* Thomas, Subsection *Paniculata* Thomas, of Subgenus *Euclerodendrum* (Schau.) Thomas.

A key to help distinguish this species from other African species will be found under C. *dusenii* Gürke in the present series of notes [59: 335].

Nothing is known to me of this species beyond what is stated in its rather brief bibliography (above).

CLERODENDRUM KISSAKENSE Gürke, Engl. Bot. Jahrb. 28: 304 [as "*Clerodendron*"]. 1900; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 48 & 94. 1936.

Synonymy: *Clerodendron kissakense* Gürke, Engl. Bot. Jahrb. 28: 304. 1900. *Clerodendron kissakiense* Gürke apud K. Schum., Usts Bot. Jahresber. 28 (1): 496 sphalm. 1902.

Bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 520. 1900; Engl., Bot. Jahrb, 28: 466. 1900; Gürke, Engl. Bot. Jahrb. 28: 304. 1900; K. Schum., Usts Bot. Jahresber. 28 (1): 496. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 44. 1904; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 13, 17, 48, 89, & 94. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 49 & 90 (1942) and ed. 2, 116 & 182. 1949; Mold., Résumé 144 & 450. 1959; Gillett, Kew Bull. 14: 342--344. 1960; Townsend, Excerpt. Bot. A.3: 127. 1961; Mold., Résumé Suppl. 9: 3. 1964; Mold., Fifth Summ. 1: 235 & 448 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 225 & 538. 1980.

A small shrub, about 50 cm. tall; stems erect, completely glabrous, basally woody; internodes unusually elongate, 6--10 cm. long; leaves clustered on short branches, somewhat fleshy, nigrescent in drying, lanceolate, 4--6 cm. long, 10--15 mm. wide, apically short-acuminate, marginally mostly indistinctly and irregularly serrate, basally gradually narrowed, completely glabrous on both surfaces; inflorescence terminal, subspicate, dense, 8--12 cm. long, composed of few-flowered verticillate cymes resembling a menthaceous inflorescence; bracts lanceolate, sessile, 5--10 mm. long, mostly only 1 mm. wide, apically acute, glabrous; pedicels 6--10 mm. long; calyx broadly campanulate, 5--6 mm. long, glabrous, 5-lobed almost to the middle, the limb oblique, the lobes semiorbicular, wider than long, about as long as the tube, with their margins overlapping; corolla hypocrateriform, greenish-yellow, the upper lip bluish, the tube slightly longer than the calyx, the lower lip cymbiform, bearing on its inner basal portion a flat spoonlike projection; filaments 12--15 mm. long, basally tomentose.

This species is based on *Goetze 41* from on laterite on a light tree-steppe at Kissaki [Kisiki], at 250 m. altitude, Usagara, Tanganyika [Tanzania], collected in anthesis on October 28, 1898, and

deposited in the Berlin herbarium, now destroyed. Gürke (1900) notes that "Diese eigentümliche Art gehört der Section *Cyclonema* an, weicht aber von allen bisher bekannten Arten durch den zusammengesetzt ährenförmigen Blütenstand ab, der ihr einen mehr Labiaten-ähnlichen Habitus verleiht."

Gürke (1900), Baker (1900), and Engler (1900) each cite only the original collection, but Thomas (1936) adds *Stuhlmann 713*, also from Tanganyika. Gillett (1960) comments that it is possibly conspecific with *C. wildii* Mold. [now known as *C. makanjanum* H. Winkler] , "but best left sub judice pending further collection".

Nothing is known to me of *Clerodendrum kissakense* beyond what is stated in its rather meager bibliography (above).

CLERODENDRUM KISSAKENSE var. *ROVUMENSE* Gürke, Engl. Bot. Jahrb. 28: 304 & 466 [as "*Clerodendron*"]. 1900; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 89. 1936.

Synonymy: *Clerodendron kissakense* var. *rovumense* Gürke, Engl. Bot. Jahrb. 28: 304 & 466. 1900.

Bibliography: Gürke, Engl. Bot. Jahrb. 28: 304 & 466. 1900; B. Thomas. Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 89. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 49 & 90 (1942) and ed. 2, 116 & 182. 1949; Mold., Résumé 144 & 450. 1959; Mold., Fifth Summ. 1: 235 (1971) and 2: 867. 1971; Mold., Phytol. Mem. 2: 225 & 538. 1980.

This variety differs from the typical form of the species in its larger leaves and red-violet corollas.

The variety is based on *Busse 1007* from Kwa Mitra on the Rovuma river, Tanganyika [Tanzania], collected on February 9, 1901, and deposited in the Berlin herbarium, now destroyed. Thomas (1936) cites the original collection and *Schlieben 6050*, also from Tanganyika.

This plant has been found growing in grassland, at 260 m. altitude, flowering in February.

It seems very doubtful if the Schlieben collection, cited below, really represent the present taxon, since the collector asserts that its corollas were "white" and it was cited by Thomas (1936) as what he called *C. lanceolatum* Gürke [now called *C. ternatum* var. *lanceolatum* (Gürke) Mold., which see].

Citations: TANZANIA: Tanganyika: ?*Schlieben 5997* (Br, Ld--photo, Mu, N, N--photo).

CLERODENDRUM KLEMMEI Elm., Leafl. Philip. Bot. 2: 514--515 [as "*Clerodendron*"]. 1908; Mold., Alph. List Comm. Vern. Names 19. 1939.

Synonymy: *Clerodendron klemmei* Elm., Leafl. Philip. Bot. 2: 514. 1908.

Bibliography: Elm. Leafl. Philip. Bot. 2: 514--515. 1908; E. D. Merr., Philip. Journ. Sci. Bot. 7: 342. 1912; Prain, Ind. Kew. Suppl. 4, imp. 1, 50. 1913; H. Hallier, Meded. Rijks Herb. Leid. 37: 75. 1918; H. J. Lam, Verbenac. Malay. Arch. 309 & 364. 1919; Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 73, 78, 109, & IX. 1921; E. D. Merr., Enum. Philip. Flow. Pl. 3: 402. 1923; Mold., Alph. List Comm. Vern. Names 19. 1939; Mold., Known Geogr. Distrib.

Verbenac., ed. 1, 62 & 90. 1942; Mold., Phytologia 2: 100. 1945; Mold., Alph. List Cit. 1: 191. 1946; H. N. & A. L. Mold., Pl. Life 2: 66. 1948; Mold., Alph. List Cit. 2: 457 (1948) and 4: 1085, 1158, & 1205. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 141 & 182. 1949; Prain, Ind. Kew. Suppl. 4, imp. 2, 50. 1958; Mold., Résumé 183 & 450. 1959; Mold., Fifth Summ. 1: 315 (1971) and 2: 868. 1971; Anon., Biol. Abstr. 54 (7): B.A.S.I.C..S.53. 1972; Mold., Phytologia 23: 315. 1972; Hocking, Excerpt. Bot. A.23: 291. 1974; Mold., Phytol. Mem. 2: 306 & 538. 1980; Brenan, Ind. Kew. Suppl. 16: 71. 1981; Holmgren & al., Ind. Vasc. Pl. Type Microf. 442. 1985; Mold., Phytologia 58: 404 (1985), 59: 343 & 409 (1986), and 61: 164-166, 270, & 330. 1986.

A small slender tree; old bark brownish, young bark smooth and yellowish, covered with elongate lenticels; leaves numerous, decussate-opposite; petioles 1--3 cm. long, rather slender, glabrous, completely deciduous; leaf-blades submembranous, lanceolate to oblong or obovate, the medium-sized ones 12 cm. long and 4 cm. wide, apically mostly acuminate, variable, basally attenuate or simply acute, flat, glabrous; secondaries 5--7 per side, ascendingly curvate, prominent beneath; veinlet reticulation coarse, prominent beneath; inflorescence terminal or subterminal, paniculate or subcorymbose, the cymes much branched; peduncles smooth, glabrous, yellowish, ascending, 4--7 cm. long, more or less flattened distally; secondary peduncles less than half that length, rather numerous and fastigiate, subtended by filiform bracts 5 mm. long; pedicels 5--8 mm. long, puberulent, usually bibracteate at the middle; calyx campanulate, 4 mm. long, glabrous, its 5 segments 1.5 mm. long and apically acute; corolla tubular, 6 cm. long, apically gradually widened, glabrous, deciduous, the limb 5-lobed, the lobes oblong, regular, 5--7 mm. long, 3 mm. wide, apically obtuse, spreading; stamens 4, surpassing the corolla by 1 cm., glabrous, inserted some distance below the corolla-mouth; anthers versatile, oblong, 2.5 mm. long; style slender, equaling the stamens, glabrous; stigma subclavate, with a pronounced point; ovary dome-shaped, glabrous; fruiting-calyx with the portion containing the fruit much expanded and with a thin apiculate rim; fruit drupaceous, obovoid, 13 mm. long, 10 mm. wide, olive-green, shiny, widest above the middle.

This species is based on *A. D. E. Elmer 8679* from Baguio, in Benguet Province, Luzon, Philippine Islands, collected in March of 1907. It is named after Mr. W. Klemme of the Philippine Forestry Bureau, who first discovered it in Lepanto Province. Merrill (1908) comments that "Its much smaller leaves, much larger and more numerously branched paniculate cymes, and the double length of its corolla-tube serve to segregate it from *C. simile* Merr."

Collectors describe *Clerodendrum klemmei* as a low shrub or small slender tree, 0.5--3.5 m. tall, with a stem diameter to 5 cm., the old bark brownish, the young bark smooth and yellowish, covered with elongated lenticels, the buds white, the calyx at first light-green, reddish on the sun-exposed sides, or completely red, the corolla white or creamy-white, about 6 cm. long, and the fruit ornamental, very dark dull-green, later purplish. The corolla is said

to have been "white" on *Herb. Philip. Bur. Sci. 48506, Herb. Philip. For. Bur. 30178, Loher 5042, Weiss 4248,* and *Williams 2051* and "white with bright pink" on *Clemens 16256.*

Collectors have encountered this plant in secondary forests, on pine ridges with *Adinandra*, along roadsides and streams, and on damp forested slopes and mossy summits, at 600--1600 m. altitude, in anthesis from October to March, as well as in May, and in fruit from December to April, as well as in October. Merrill (1923) asserts that it is endemic to Luzon, where it occurs "In thickets and forests at medium altitudes, ascending to 1,600 m." and is known to the natives as "luag". He cites *Curran PFB 11618, 16603,* & *16618, Curran & Merritt PFB 15834, Elmer 8679, Klemme PFB 5684, McGregor PBS 20191, Ramos PBS 7712. 7251,* & *27024,* and *Wood PFB 13059.*

Elmer mistakenly refers to the drupaceous fruit as a "capsule".

Bakhuizen (1921) has provided a key to distinguish the Indonesian species of *Clerodendrum*, as delimited by him. It is reproduced here in modified form, with the nomenclature somewhat updated.

1. Calyx very shortly toothed or subtruncate, cupuliform, in fruit never reflexed, and when mature always smaller than the fruit.
  2. Leaf-blades ovate or oblong, basally obtuse or abruptly and shortly acute-acuminate.
    3. Cymes borne in the axils of normal leaves, forming a leafy inflorescence; straggling or climbing shrubs.....*C. inerme.*
    3a. Cymes borne in the axils of bracts, forming a leafless terminal panicle; erect shrubs or small trees.
      4. Panicles dense, umbelliform, many-flowered; corolla-tube 1--1.7 cm. long; calyx 2--3.5 mm. long.....*C. sahelangii.*
      4a. Panicles lax; corolla-tube more than 2.5 cm. long; calyx more than 3.5 mm. long.
        5. Calyx and corolla externally pilose; corolla about 3 cm. long.....*C. mindorense.*
        5a. Calyx and corolla externally glabrous; corolla about 6 cm. long.....*C. klemmei.*
  2a. Leaf-blades obovate, basally acutely attenuate.
    6. Corolla light-blue, zygomorphic, the tube wide-cylindric, 1½ to 2 times as long as the calyx; panicles elongate; leaf-blades glabrous on both surfaces except for the larger venation.....*C. serratum.*
    6a. Corolla white or pale-yellow, actinomorphic, the tube slender, many times as long as the calyx; panicles short, umbelliform; leaf-blades densely pilose on both surfaces.....*C. incisum.*

1a. Calyx distinctly lobed, usually to the middle or beyond, when stellately spreading or reflexed during the fruiting stage often torn, mostly as large or larger than the fruit.
  7. Well-developed leaf-blades widest at or above the middle, the basal secondaries not stronger than the rest; leaf-blades basally acuminate or cuneate (rarely cordate).
    8. Corolla dark-red or crimson; climbing shrubs.
      9. Corolla-tube 3 or more times as long as the calyx, externally subglabrous; calyx small, red, 5 mm. long or less...

C. *splendens*.

9a. Corolla-tube less than twice as long as the calyx, externally softly pubescent; calyx large, white (during anthesis) or purple (in fruit), 1.5--2.5 cm. long.....C. *thomsonae*.

8a. Corolla white or light-yellow, rarely flesh-color or orange; erect shrubs or small trees.

10. Corolla-tube not over 5 cm. long, usually less than 4.5 cm.

11. Corolla externally glabrous.....C. *laevifolium*.

11a. Corolla externally densely glandular-pilose.

12. Leaf-blades glabrous on both surfaces; corolla-lobes unequal, obliquely spreading.

13. Inflorescence pendulous, racemose; calyx large, inflated, externally glabrous; corolla-tube 1--1.5 cm. long, less than twice as long as the calyx..... C. *wallichii*.

13a. Inflorescence erect, wide-paniculate; calyx small, externally hairy; corolla-tube 2--3 cm. long, 2--4 times as long as the calyx.....C. *phyllomega*.

12a. Leaf-blades pubescent on both surfaces or at least beneath; corolla-lobes equal and similar, spreading subradially when mature.

14. Inflorescence pendulous, umbelliform or subcapitate, densely many-flowered; corolla flesh-color.C. *deflexum*.

14a. Inflorescence erect, loosely paniculate, often leafy.

15. Calyx-segments narrow, linear or subulate, extending almost to the base.

16. Leaf-blades irregularly subcrenate-serrate, apically obtuse, basally abruptly and shortly acute-attenuate, the surface rugose; corolla-tube internally glabrous.....C. *calamitosum*.

16a, Leaf-blades marginally entire or irregularly and distantly dentate above the middle, apically short acuminate, basally cuneate, rounded, or cordate.

17. Small shrubs, usually less than 1 m. tall; stem fistular and inhabited by ants; leaf-blades elliptic or elliptic-obovate, basally broadly rounded or cordate, marginally entire or undulate-denticulate; panicle thyrsoid; corollas bright-yellow, tinged with red...C. *breviflorum*.

17a. Shrubs 1--3 m. tall; stems not fistular; leaf-blades oblong or obovate, basally cuneate and obtuse to rounded,marginally irregularly and distantly serrate above the middle, rarely subentire; corolla white or pale-yellow..... C. *disparifolium*.

15a. Calyx-segments broadly ovate or oblong, apically acute or obtuse, extending only ½ to 2/3 the length [rarely, in C. *fortunatum*, almost to the base].

18. Calyx inflated campanulate, externally glabrous or sparsely pilose; leaf-blades marginally irregularly dentate or rarely subentire.

19. Panicles terminal, leafy below; calyx externally glabrous, 5-cleft to ½ its length; corolla-tube 2-3 times as long as the calyx; leaf-blades ovate or ovate-rhomboid, marginally irregularly and bluntly serrate except at the apex and base..*C. phlomidis.*

19a. Panicles composed of axillary cymes, leafy; calyx externally sparsely pilose, cleft almost to the base; corolla-tube about as long as the calyx; leaf-blades oblong-lanceolate, elliptic or subobovate, marginally irregularly dentate or subentire *C. fortunatum.*

18a. Calyx infundibular, externally densely puberulent; leaf-blades marginally entire, rarely dentate.

20. Inflorescence terminal, sometimes leafless except at the base; corolla-tube 1.5--2.5 cm. long; leaf-blades basally obtuse to rounded or sometimes subcordate.....*C. porphyrocalyx.*

20a. Inflorescence composed of cymes in the axils of normal leaves; corolla-tube 4--5 cm. long; leaf-blades basally acute-attenuate.....*C. ingratum.*

10a. Corolla-tube more than 5 cm. long, rarely less than 6 cm.

21. Cymes in the axils of normal leaves, 1--5-flowered; leaves in whorls of 3--5, rarely opposite, 10 or more times as long as wide.....*C. indicum.*

21a. Inflorescence terminal, leafless; leaves always opposite, the blades less than 7 times as long as wide.

22. Calyx cleft to the base, the lobes narrowly lanceolate.

23. Calyx and corolla externally glabrous; leaf-blades densely glandular-punctulate beneath; undershrubs about 1 m. tall, with hollow club-shaped internodes which have 2 opposite holes apically.....*C. fistulosum.*

23a. Calyx and corolla externally pubescent; leaf-blades not or only scarcely glandular-punctulate beneath; shrubs or small trees about 5 m. tall; internodes often inflated but without holes.....*C. ridleyi.*

22a. Calyx-lobes not over 2/3 the length, the segments ovate or deltoid.

24. Corolla externally glabrous; branchlets without distinct lenticels.....*C. longiflorum.*

24a. Corolla externally puberulent; branchlets with distinct light-colored lenticels.

25. Calyx externally densely puberulent.*C. quadriloculare.*

25a. Calyx externally glabrous.

26. Calyx tubular, inflated, 2--3.5 cm. long; leaf-blades glabrous on both surfaces.....*C. minahassae.*

26a. Calyx campanulate, 1--1.5 cm. long; leaf-blades puberulent on both surfaces.....*C. capitatum.*

7a. Well developed leaves widest below the middle; basal secondaries much stronger than the others; leaf-blades basally obtuse to rounded or cordate.

27. Corolla-tube 10--12 cm. long; calyx externally glabrous..... *C. hastatum.*

27a. Corolla-tube less than 10 cm. long; calyx externally pilose.
28. Inflorescence leafy, composed of cymes in the axils of normal leaves.
29. Corolla externally glabrous; calyx very small, in fruiting stage smaller than the fruit.....C. *colebrokianum*.
29a. Corolla externally pilose; calyx rather large, in fruiting stage larger than the fruit.
30. Cymes capitate, densely many-flowered, with large, foliaceous, persistent bracts; leaf-blades densely villous on both surfaces, marginally entire.....C. *bracteatum*.
30a. Cymes loose, rather few-flowered, with small deciduous bracts; leaf-blades very sparsely pilose on both surfaces or glabrous except for the venation, marginally distantly serrate-dentate or the lowest 3-lobed.....C. *trichotomum*.
28a. Inflorescence terminal, most of the cymes in the axils of bracts.
31. Inflorescence dense, globose, or composed of capitate cymes; bracts usually large and foliaceous, subpersistent; corolla-lobes regularly spreading.
32. Corolla externally densely villous.....C. *macrostegium*.
32a. Corolla externally glabrous.
33. Corolla-tube 2--3 cm. long; calyx 1.5--2.5 cm. long, externally with many large peltate glands; leaf-blades marginally irregularly crenate-serrate or rarely entire.
34. Corollas all "single", not "doubled"...C. *philippinum*.
34a. Corollas mostly or all "doubled.
35. Corollas all "doubled"..C. *philippinum* f. *multiplex*.
35a. A few "single" corollas interspersed with "doubled" ones.....C. *philippinum* f. *subfertile*
33a. Corolla-tube 4--6 cm. long; calyx 1--1.2 cm. long, without peltate glands; leaf-blades marginally entire... C. *cunninghamii*.
31a. Inflorescence elongate, paniculate; bracts small and caducous; corolla more or less oblique.
36. Corolla-tube externally distinctly and densely pilose, usually with long hairs.
37. Calyx and corolla internally long-pilose; corolla-tube usually less than 1½ times as long as the calyx, rarely longer.
38. Calyx deeply cleft to the middle, greenish.C. *villosum*
38a. Calyx lobed not as far as the middle, red.
39. Calyx less than 1 cm. long, externally appressed short-pilose except on the subglabrous short-deltoid lobes; corolla small, the tube 0.5--1 cm. long; leaf-blades marginally entire.....C. *brachyanthum*.
39a. Calyx 1--1.5 cm. long, externally densely long-pilose, the lobes lanceolate; corolla large, the tube 1--2 cm. long; leaf-blades marginally distantly serrate-dentate or rarely subentire..C. *lanuginosum*.
37a. Calyx and corolla internally short-pilose or glabrous; corolla-tube more than 1½ times as long as the calyx.

40. Calyx cleft beyond the middle, usually almost to the base, the lobes broadly ovate, dorsally sparsely strigose-pilose, with many large glands.....C. *viscosum*.
40a. Calyx not cleft as far as the middle, the lobes oblong-lanceolate, dorsally densely hairy but without obvious glands.
41. Calyx 2--2.5 cm. long; leaf-blades marginally distantly serrate-dentate.....C. *preslii*.
41a. Calyx less than 1.5 cm. long; leaf-blades marginally entire.
42. Corolla-tube less than twice as long as the calyx; calyx externally long-pilose.....C. *cumingianum*.
42a. Corolla-tube more than twice as long as the calyx; calyx externally short-pilose.....C. *buruanum*.
36a. Corolla-tube externally glabrous or minutely and inconspicuously pubescent.
43. Calyx not or scarcely incised as far as the middle; corolla mostly white,
44. Calyx-teeth triangular-acute, 2--3 mm. long..... C. *buruanum* f. *lindawianum*.
44a. Calyx-lobes 4 mm. long, apically long-acuminate or caudate.....C. *confusum*.
43a. Calyx incised beyond the middle; corolla orange or red.
45. Leaf-blades hairy beneath, not squamulose.
46. Calyx 3--5 mm. long, the lobes narrow, lanceolate, erect or appressed; corolla-tube 5--6 times as long as the calyx, its lobes 7--10 mm. long, 4--5 mm. wide; buds 3--5 mm. wide; stamens 2--2.5 cm. long, twice as long as the corolla-lobes; style 3--4 cm. long.....C. *buchanani*.
46a. Calyx 7--12 mm. long, the lobes ovate or deltoid, spreading; corolla-tube 3--4 times as long as the calyx, the lobes 1--2.5 cm. long, to 10 mm. wide; buds 7--12 mm. wide; stamens 4--6 cm. long, 3 times as long as the corolla-lobes; style 6--7 cm. long.....C. *speciosissimum*.
45a. Leaf-blades glabrous beneath except on the venation, densely glandular-punctulate or peltate-squamulose.
47. Calyx and corolla externally more or less pubescent or puberulent; leaf-blades densely squamulose beneath (rarely minutely glandular).
48. Leaf-blades normally 3--7-lobed; calyx 2--5 mm. long, the lobes ovate, 1.5--2 mm. long, apically subobtuse; corolla orange, the tube 4--6 times as long as the calyx.....C. *paniculatum*.
48a. Leaf-blades not lobed; calyx 5--15 mm. long, the lobes oblong or elliptic, more than 4 mm. long, apically acute; corolla dark-red, its tube less than 4 times as long as the calyx.
49. Calyx 1--1.5 cm. long; corolla to 2.4 cm. long, the tube equaling or slightly longer than the calyx..... C. *japonicum*.
49a. Calyx less than 1 cm. long; corolla to 3.8 cm. long,

the tube twice as long as the calyx.....C. *kaempferi*.

47a. Calyx and corolla externally glabrous; leaf-blades densely punctulate beneath.

50. Leaf-blades basally cordate-rotund; calyx 1.8--2.5 cm. long, 3-partite; corolla-tube 2.5--3.3 cm. long, the lobes 2--2.5 cm. long; stamens 3--4 cm. long.....C. *hettae*.

50a. Leaf-blades basally cuneate or subtruncate; calyx 1.3--1.7 cm. long, 2--5-partite; corolla-tube 1.4--2 cm. long, the lobes 1--1.5 cm. long; stamens 7--9 cm. long...C. *magnificum*.

Material of *Clerodendrum klemmei* has been misidentified and distributed in some herbaria as C. *commersonii* Lam., C. *longiflorum* Decaisne, C. *quadrangulare* Merr., C. *quadriloculare* (Blanco) Merr., and C. *mindorense* Merr. On the other hand, the *Ramos PBS 7251*, distributed as typical C. *klemmei*, actually is the type collection of its var. *puberulum* Mold.

Citations: PHILIPPINE ISLANDS: Luzon: *Allard s.n.* [1/25/38] (Or--52745); *Ahern's Collector, Herb. Philip. For. Bur. 1881* (N); C. F. *Baker 941* (Mu--4227); P. T. *Barnes, Herb. Philip. For. Bur. 339* (N); M. S. *Clemens 16256* (Ca--283715, N); *17238* (Ca--302749, Gg--158302), *17239* (Ca--302748), *s.n.* [Baguio, Oct. 1927] (Ca--346744); *Costales, Herb. Philip. For. Bur. 30178* (Ca--320892); *H. M. Curran, Philip. For. Bur. 16618* (W--16618); *Curran & Merritt, Herb. Philip. For. Bur. 15834* (W--711525); F. *W. Darling, Herb. Philip. For. Bur. 14415* (N); *Elmer 5964* (Bz--19739), *8679* (Bz--19740--isotype, L--isotype, Ld--isotype, Ld--photo of isotype, N--isotype, W--629964--isotype); *Klemme, Herb. Philip. For. Bur. 5684* (N, W--709455); *Loher 5042* (W--447137), *12322* (Bz--19737); R. C. *McGregor, Herb. Philip. Bur. Sci. 20191* (N, W--901773); E. *D. Merrill 2338* (N), *3746* (N); M. *Ramos 1336* (Bz--20089, N), *Herb. Philip. Bur. Sci. 7712* (N, W--629295), *Philip. Bur. Sci. 27024* (W--1293797); *Ramos & Edaño, Herb. Philip. Bur. Sci. 46831* (Ca--309329, N, W--1527801), *Herb. Philip. Bur. Sci. 48506* (Bz--19736, Ca--322118, N, Pd, Pd, S, W--1527911), *Herb. Philip. Bur. Sci. 48612* (Ca--322043, N); *Vanoverbergh 1528* (Go, Lu, S, Ut--53621, Vi, W--1238093), *2368* (Ws); *Weiss 4248* (Bz--20087); R. *S. Williams 394* (N), *2051* (N, N).

CLERODENDRUM KLEMMEI var. *PUBERULUM* Mold., Phytologia 23: 315. 1972.

Bibliography: E. D. Merr., Enum. Philip. Flow. Pl. 3: 402. 1923; Anon., Biol. Abstr. 54 (7): B.A.S.I.C. S.53. 1972; Mold., Phytologia 23: 315. 1972; Hocking, Excerpt. Bot. A.23: 291. 1974; Mold., Phytol. Mem. 2: 306 & 538. 1980; Brenan, Ind. Kew. Suppl. 16: 71. 1981; Holmgren & al., Ind. Vasc. Pl. Type Microf. 442. 1985.

This variety differs from the typical form of the species in having the inflorescences, including the peduncles, sympodia, pedicels, calyxes during anthesis, and outer surface of the corolla-tubes, densely puberulent.

The variety is based on *Maximo Ramos, Herb. Philip. Bur. Sci. 7251* from the province of Abra, on the island of Luzon, Philippine Islands, collected in January or February of 1909, and deposited in the United States National Herbarium in Washington. The general appearance of the inflorescence is much like that seen in C. *quadri-*

loculare (Blanco) Merr. or *C. mindorense* Merr., but the calyx-lobes are quite different. Thus far the variety is known to me only from the type collection, originally distributed and cited by Merrill as typical *C. klemmei* Elm.

Citations: PHILIPPINE ISLANDS: Luzon: *M. Ramos, Herb. Philip. Bur. Sci. 7251* (N--isotype, W--629193--type).

CLERODENDRUM KWANGTUNGENSE Hand.-Mazz., Anz. Akad. Wiss. Wien Math.-Nat. 59: 111 [as "*Clerodendron*"]. 1922; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 57 & 90. 1942.

Synonymy: *Clerodendron kwangtungense* Hand.-Mazz., Anz. Akad. Wiss. Wien Math.-Nat. 59: 111. 1922. *Clerodendrum kewangtungense* Hand.-Mazz., in herb.

Bibliography: Hand.-Mazz., Anz. Akad. Wiss. Wien Math.-Nat. 59: 111. 1922; Krause, Justs Bot. Jahresber. 59 (2): 90. 1924; A. W. Hill, Ind. Kew. Suppl. 7: 51. 1929; Fedde & Schust., Justs Bot. Jahresber. 53 (1): 1072. 1932; P'ei, Mem. Sci. Soc. China 1 (3): 125 & 152--153, pl. 28. 1932; Worsdell, Ind. Lond. Suppl. 1: 238. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 57 & 90. 1942; Mold., Alph. List Inv. Names Suppl. 1: 6. 1947; Mold., Alph. List Cit. 4: 1011. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 131 & 182. 1949; Mold., Résumé 169, 265, & 450. 1959; Mold., Résumé Suppl. 15: 19. 1967; Mold., Fifth Summ. 1: 288, 448, & 463 (1971) and 2: 868. 1971; Altschul, Drugs Foods 247. 1973; Mold., Phytol. Mem. 2: 277, 538, & 539. 1980; Mold., Phytologia 60: 181. 1986.

Illustrations: P'ei, Mem. Sci. Soc. China 1 (3): pl. 28. 1932.

A woody shrub, about 1.7 m. tall; branches slender, very finely strigillose-tomentellous, sparsely and minutely lenticellate; leaves decussate-opposite; petioles ¼ to 1/3 as long as the leaf-blades, angular, deeply sulcate above, sparsely strigillose; leaf-blades concolorous, ovate, 7½--15.5 cm. long, 2--2 2/3 times narrower than long, apically subcaudate-acuminate, marginally entire or here and there coarsely spreading sinuate-dentate, basally broadly cuneate or rounded to truncate and very slightly extended into the petiole-apex, glabrous or subglabrous on both surfaces except for the ciliolate margins and the sparsely strigillose midrib and larger venation; midrib prominulent and flattish above, prominent beneath; secondaries 4 or 5 per side, the basal ones very oblique, confluent near the margins; veinlet reticulation loose; inflorescence corymbose, the dimensions 9 x 13--14 x 22 cm., rather flattish, loose, basally trichotomous or shortly racemose, very finely strigillose-tomentellous, the ramifications elongate, 3--5 times dichotomous, "cum floribus alaribus" [fide Handel-Mazzetti]; bracts reduced or the lower ones foliaceous and 10 mm. long; pedicels 1.5--3 mm. long (in fruit to 14 mm. long), rather rigid; flowers numerous, fragrant; calyx green, 3.5--5 mm. long and wide, divided to 2/3 or 3/4 its length, the lobes ovate-oblong, herbaceous, externally sparsely asperous, the basal cup in fruit elongated to 4 mm.; corolla white, externally loosely glandular with the lower glands short-stipitate and the upper ones sessile, with a few scattered short setae intermixed, the tube very slender, short, 2.2--2.5 cm. long, the lobes

narrowly oblong, 4--6 mm. long, undulate, apically rounded; stamens exserted 5--18 mm. beyond the corolla-mouth; anthers oblong, 1.2 mm. long, centrally attached, obtuse at both ends; style surpassing the corolla by scarcely 1 cm; fruit drupaceous, externally smooth.

This species is based on *Mell 914* from 800 m. altitude at Lungtoushan, Kwangtung, China, collected in September of 1917, and deposited in the Vienna herbarium. P'ei (1932) comments that "This is allied to *C. trichotomum* Thunb., from which it differs by much smaller and more numerous flowers. *Ching 2021*, tentatively referred here, differs from the type of *Clerodendron kwangtungense* Hand.-Maz. by its pilose and glandular calyx and bracts and in the absence of lenticels. The specimen has very young flowers and when mature material is available it may prove to represent a distinct specie [sic]." He cites only *Mell 914* from Kwangtung and *Ching 2021* from Chekiang -- the Ching collection is now regarded as representing var. *puberulum* Li.

This species is a member of Subgenus *Euclerodendron*, Subsection *Paniculata*. Curiously, Fedde & Schuster (1932) cite the original publication by Handel-Mazzetti to "Akad. Anz. Wien Nr. 12 (1922) p. 11". Altschul (1973) reports that the fruits are edible. Tsang encountered the plant in dry sandy soil of thickets, in flower in September, and reports the vernacular name "pak tsz shue". He refers to it as "fairly common".

A key to help distinguish *C. kwangtungense* from other Chinese species will be found under *C. henryi* P'ei in the present series of notes [60: 180--181].

Citations: CHINA: Kwangtung: *Mell 914* [R. M. King neg. 295] (N--photo of isotype, W--photo of isotype); *Sin 11396* (N); *Tsang 21581* (Ca--11130, I, Mi, N, N, S). MOUNTED ILLUSTRATIONS: P'ei, Mem. Sci. Soc. China 1 (3): pl. 28. 1932 (Ld--photo of isotype).

CLERODENDRUM KWANGTUNGENSE var. *PUBERULUM* Li, Journ. Arnold Arb. 25: 426 [as "*Clerodendron*"]. 1944; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 131 & 182. 1949.

Synonymy: *Clerodendron kwangtungense* var. *puberulum* Li, Journ. Arnold Arb. 25: 426. 1944.

Bibliography: P'ei, Mem. Sci. Soc. China 1 (3): 153. 1932; Li, Journ. Arnold Arb. 25: 426. 1944; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 131 & 182. 1949; Mold., Resumé 169, 265, & 450. 1959; Mold., Fifth Summ. 1: 288 & 449 (1971) and 2: 868. 1971; Mold., Phytol. Mem. 2: 277 & 539. 1980.

This variety differs from the typical form of the species in the leaf-blades being sparsely puberulent on both surfaces and the inflorescence densely puberulent.

The variety is based on *T. M. Tsui 785* from Yang-Shan, in the Yang Shan District of Kwangtung, China, collected between July and September, 1932. The collector describes the plant as a shrub, 9 feet tall, with bluish fruit. The Ching collection, from partially shaded woods, at 125--185 m. altitude, is described as "a shrub of tree form, 5 feet tall, the calyx tinged purplish", originally identified as *C. trichotomum* Thunb. and by P'ei as perhaps *C. kwangtungense* or perhaps a distinct species.

Citations: CHINA: Chekiang: *Barchet 125* (E--118829); *Ching 2021* (W--1246880). Kwangtung: *Tsui 785* (N--isotype).

CLERODENDRUM LACINIATUM Balf. f., Journ. Linn. Soc. Lond. Bot. 16: 19 [as "*Clerodendron*"]. 1877; Mold., Alph. List Comm. Vern. Names 5 & 22. 1939.

Synonymy: *Clerodendron laciniatum* Balf. f., Journ. Linn. Soc. Lond. Bot. 16: 19. 1877.

Bibliography: J. G. Baker, Fl. Maurit. 254 & 255. 1877; Balf. f., Journ. Linn. Soc. Lond. Bot. 16: 19. 1877; Balf. f., Phil. Trans. Roy. Soc. Lond. 168: pl. 32. 1879; Baill., Dict. Bot. 3: 418. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 561. 1893; Gerth van Wijk, Dict. Plantnames, imp. 1, 1: 335 (1911) and imp. 1, 2: 176 & 1041. 1916; Stapf, Ind. Lond. 2: 238. 1930; Mold., Alph. List Comm. Vern. Names 5 & 22. 1939; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 53 & 90. 1942; Mold., Phytologia 2: 100. 1945; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 123 & 182. 1949; Mold., Résumé 157 & 450. 1959; Gerth van Wijk, Dict. Plantnames, imp. 2, 1: 335 (1962), imp. 2, 2: 176 & 1041 (1962), imp. 3, 1: 335 (1971), and imp. 3, 2: 176 & 1041. 1971; Mold., Fifth Summ. 1: 261 (1971) and 2: 868. 1971; Mold., Phytol. Mem. 2: 252 & 539. 1980; Mold., Phytologia 60: 186. 1986.

Illustrations: Balf. f., Phil. Trans. Roy. Soc. Lond. 168: pl. 32. 1879.

A shrub or small tree; branchlets ashy-gray, terete, apically minutely puberulent; leaves decussate-opposite, petiolate; leaf-blades membranous or membranous-coriaceous, ovate or ovate-oblong (when adult) to rhomboid, 5--7.8 cm. long, apically acute, marginally entire, basally cuneate to subdeltoid, glabrous, paler beneath, the "juvenilibus filiformiter tripinnatipartitis, segmentis distantibus puberulis ligulatis obtusis per formas intermedias in adultam transeuntibus" [fide Balfour] or "bipinnatifid with distant long ligulate obtuse segments ½ to 1/6 in. broad" [fide Baker]; cymes axillary, short-pedunculate, few-flowered, twice trifid [fide Balfour] or the flowers in close terminal corymbs 5--7.8 cm. wide [fide Baker], spreading; bractlets very minute; pedicels 3--6 mm. long, puberulent; calyx campanulate or cupuliform, 3 mm. long, glabrous, the rim truncate, entire or obscurely lobed, finally spreading; corolla infundibular, 1.2--1.8 cm. long, about 6 times as long as the calyx, the tube internally resinous-papillate, the lobes obovate, subequal, shorter than the tube, apically obtuse; filaments shortly exserted, about twice as long as the corolla-limb.

The type of this species, with its leaves so different in the juvenile form, was collected by Balfour on the island of Rodriguez in the Mascarene Islands, where is is said to be "not uncommon on the hillslopes and in the valleys", according to Baker (1877) or widely dispersed, according to Balfour (1877). The latter author asserts that *C. heterophyllum* (Vent.) R. Br., of Mauritius, "is a near ally, but differs in the character of its heterophylly and in the flowers". The vernacular name on the island for *C. laciniatum* is "bois cabri" or "nasty tree". A key, suggested by Baker (1877),

to distinguish it from other Mascarene and Seychelles species is found under C. *heterophyllum* (Vent.) R. Br. in the present series of notes [60: 186].

Nothing is known to me of this species beyond what is given in its rather brief bibliography (above).

CLERODENDRUM LAEVIFOLIUM Blume, Bijdr. Fl. Ned. Ind. 14: 808. 1826 [not C. *laevifolium* Decaisne, 1834].

Synonymy: *Clerodendrum ellipticum* Zipp. ex Span., Linnaea 15: 329. 1841. *Clerodendron laevifolium* Blume apud D. Dietr., Syn. Pl. 3: 616. 1842 [not C. *laevifolium* Bakh., 1942, nor H. J. Lam, 1921]. *Clerodendron ellipticum* Zipp apud Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 561. 1893. *Clerodendron disparifolium* Hassk. apud Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 109 in syn. 1921 [not *Clerodendron disparifolium* Bakh., 1938, nor Blume, 1855, nor Kochum., 1980, nor *Clerodendrum disparifolium* Blume, 1826]. *Clerodendrum laeuifolium* Farnsworth, Pharmacog. Titles 5 (4): iv sphalm. 1970. *Clerodendron disparifolium* var. *pubiflorium* Bakh., in herb. *Clerodendron javanicum* L., in herb. [not C. *javanicum* Spreng., 1825, nor Walp., 1844]. *Clerodendron laevigatum* Blume, in herb.

Bibliography: Blume, Bijdr. Fl. Ned. Ind. 14: 808. 1826; Decaisne, Nouv. Ann. Mus. Hist. Nat. Paris 3: 399--400. 1834; Steud., Nom. Bot. Phan., ed. 2, 1: 383. 1840; Span., Linnaea 15: 329. 1841; D. Dietr., Syn. Pl. 3: 616. 1842; Hassk., Cat. Pl. Hort. Bot. Bogor. Cult. Alt. 136. 1844; Walp., Repert. Bot. Syst. 4: 103. 1845; Schau. in A. DC., Prodr. 11: 674. 1847; Buek, Gen. Spec. Syn. Candoll. 3: 106. 1858; Miq., Fl. Ned. Ind. 2: 872. 1858; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 561. 1893; Koord. & Valet., Meded. Lands Plant. Bog. 42 [Bijdr. Boomsart. Java 7]: 212. 1900; Backer, Tropische Natuur 5: 94. 1916; H. J. Lam, Verbenac. Malay. Arch. 266, 363, 364, & [371]. 1919; Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 74, 80--81, 85, 108, 109, & IX. 1921; E. D. Merr., Univ. Calif. Publ. Bot. 15: 264. 1929; Corner, Wayside Trees, ed. 1, pl. 213 (dext.). 1940; Meeuse, Blumea 5: 74. 1942; Mold., Known Geog. Distrib. Verbenac., ed. 1, 54, 61, 63, 65, 66, & 90. 1942; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 561. 1946; Mold., Alph. List Cit. 1: 26 (1946), 2: 449 (1948), and 4: 1017, 1232, & 1260. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 124, 126, 138, 143--147, & 182. 1949; Corner, Wayside Trees, ed. 2, 695, 700, & 701, pl. 13, fig. 256. 1952; Mold., Biol. Abstr. 27: 3121. 1953; Mold., Résumé 159, 161, 177, 179, 187, 188, 190, 192, 193, 196, 197, 216, 450, & 451. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 561. 1960; Mold., Résumé Suppl. 3: 19 & 20 (1962), 4: 9 (1962), and 5: 6. 1962; Chan & Teo, Chem. Pharm. Bull. Tokyo 17: 1284--1286. 1969; Farnsworth, Pharmacog. Titles 5 (4): iv. 1970; Willaman & Li, Lloydia 33, Suppl. 3a: 220. 1970; Farnsworth, Pharmacog. Titles 5, Cumul. Gen. Ind. 1971; Mold., Fifth Summ. 1: 267, 271, 273, 295, 300, 304, 322, 330, 359, 449, & 463 (1971) and 2: 868. 1971; Mold., Phytologia 28: 454 (1974) and 34: 265. 1976; Mold., Phytol. Mem. 2: 259, 270, 284, 291, 295, 313, 320, 349, & 539. 1980; Mold. in Dassan.

& Fosb., Rev. Handb. Fl. Ceyl. 4: 440. 1983; Holmgren & al., Ind. Vasc. Pl. Type Microf. 441. 1985; Mold., Phytologia 58: 183 (1985), 59: 325, 330, 331, 481, & 482 (1986), and 61: 105. 1986.

Illustrations: Corner, Wayside Trees, ed. 1, pl. 213, fig. 256 (1940) and ed. 2, pl. 13, fig. 256. 1952.

A small, slender, spindly tree or treelet, 3--18 m. tall, or a very lax and slender bush, shrub, or undershrub, 1--4 m. tall, often already flowering at slightly over a meter in height, when arborescent with a clear bole, 3--6.8 m. high, a girth of 75 cm., and a stem diameter to 6 cm., erect; stems tetragonal; outer bark smooth or with checkered cracks, pale- or light-green to whitish, gray, or yellowish-brown; inner bark greenish or pale-greenish to yellowish or grayish-brown; sapwood white or whitish to yellowish; branches spreading and re-branched; twigs slender, green, shiny, glabrous; leaves decussate-opposite, spreading, quickly wilting, very variable in size, those on the upper side of the twigs being small and those on the underside large (hence every other node bears a pair of unequally-sized leaves); petioles very slender, 0.6--10 cm. long, apically and basally swollen; leaf-blades thin-membranous, rather narrowly elliptic or oblong-lanceolate, 2.5--25 cm. long, 1.8--11.5 cm. wide, apically long-attenuate or acuminate, marginally entire, basally acuminate, pale-green on both surfaces or paler only beneath, glabrous on both surfaces, shiny, rather crinkled; midrib very slender; secondaries 5--7 pairs, very slender; inflorescence terminal, erect, paniculate, 7.5--20 cm. long, brachiate, basally leafy, the axes purple-tinged, the panicle-branches "all on the lower side, drooping, often reddish [fide Corner]; pedicels ascending, green or greenish, elongate; bracts often red; calyx campanulate, red or dull-reddish to purple, sometimes "green outside, violet inside" [fide Corner], deeply 5-fid, the lobes 6 mm. long, apically pointed; corolla hypocrateriform, white or light-yellow to yellow, glabrous, the tube slender, 1.5--2.5 cm. long, the limb 5-parted; filaments white; anthers yellow-brown; style yellow-green; infructescence-axes dark-green to brownish; fruiting-pedicels brown; fruiting-calyx enlarged, fleshy, spreading in star-like fashion, 1.2 to 2.5 cm. wide, red or crimson to red-brown, turning dark-red, occasionally white; fruit drupaceous, globose, about 1 cm. long and wide, at first dull-green or greenish, then turning red or purple to blue, finally black or blackish, pendent.

This species was based by Blume on his unnumbered collection from Mt. Salak, Mt. Gede, "etc.", Java. His original (1826) description is: "C. foliis oppositis oblongo-lanceolatis utrinque acuminatis integerrimis glaberrimis, panicula terminali brachiato, caule tetraedro (calix campanulatus profunde quinquefidus, purpurascens; flores albidi). Crescit in fruticetis montanis Salak, Gede, etc. Floret: Martio, etc."

Decaisne (1834) modified this description to "C. ramis subtetragonis, laevibus, glabris; foliis oppositis oblongo-lanceolatis ovatisve basi et apice acuminatis, integerrimis glaberrimisque, subconcoloribus, laete viridibus, petiolatis; cymis terminalibus brachiatis foliis brevioribus;" [to be continued]